

NYASALAND (PROTECTORATE)



REPORT OF THE
POST-WAR DEVELOPMENT
COMMITTEE.

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FOREWORD.

The Post-War Development Committee, in framing its recommendations in this Report, had in mind the presentation of a statement of development which, in their view, it would be desirable to undertake in Nyasaland. Since the Report was written the Secretary of State's despatch of the 12th November, 1945, which allocates to the various Colonial Territories the funds available under the Colonial Development and Welfare Act, has been received and published. It is now necessary to review the plans embodied in the Report in the light of that despatch and to consider to what extent and at what rate these plans can be fulfilled, having regard to the moneys likely to be available from all sources. This review is at present being undertaken by the Post-War Development Committee in consultation with the Heads of Departments concerned.

ZOMBA, 3rd June, 1946.

REPORT OF THE POST-WAR DEVELOPMENT COMMITTEE.

YOUR EXCELLENCY,

In accordance with the Secretary of State's request for the early submission of a comprehensive plan of our post-war development schemes, we beg to submit the following report summarising our recommendations for the carrying out of a programme of social and economic development with the object of raising the standard of living and of increasing the general prosperity of all races in the Protectorate. Some of these recommendations have already been submitted in the following Interim Reports which are reproduced in Annexure I to this report:—

No. 1	...	PROGRESS.
No. 2	...	EDUCATION.
No. 3	...	PUBLIC HEALTH.
No. 4	...	CROPS, ANIMAL PRODUCTS, ETC.
No. 5	...	COMMUNICATIONS.
No. 6	...	FORESTRY.
No. 7	...	DEMobilISATION.
No. 8	...	EDUCATION (POLYTECHNIC).

2. While we have endeavoured to make this report as comprehensive as possible, we wish to emphasize that it should be regarded as an outline only of the Protectorate's more important and immediate requirements and not as being in any way exhaustive or final. There are other spheres of development, particularly economic, which we have not yet considered, such as the introduction of new secondary industries, a hydro-electric scheme, Municipal housing and sanitation, and we trust that it will be possible for *ad hoc* applications for grants from the Colonial Development and Welfare Act to be made subsequently in respect of such schemes.

3. The development schemes which we recommend in this report are dealt with and briefly explained in the following chapters:—

1. EDUCATION.
2. HEALTH.
3. WATER SUPPLIES.
4. CONSERVATION AND DEVELOPMENT OF NATURAL RESOURCES.
 - (a) Agriculture, including soil conservation and research.
 - (b) Stock Improvement.
 - (c) Forests.
 - (d) Stabilisation of Lake Level.
 - (e) Control of flood water in Lower River Valley.
5. COMMUNICATIONS.
 - (a) Roads.
 - (b) Road Transport.
 - (c) Rail Transport.
 - (d) Lake Transport.
 - (e) Air Transport.
 - (f) Postal, Telegraph and Telephone Services.
6. PUBLIC RELATIONS.
7. SOCIAL WELFARE HALLS.
8. URBAN AFRICAN HOUSING.
9. GOVERNMENT PROVINCIAL REBUILDING PROGRAMME.
10. SURVEYS.
11. REHABILITATION OF EX-SOLDIERS.
12. FINANCE AND CONCLUSION.

4. It has been suggested by the Joint Development Adviser that a Development Centre staffed by specialist officers should be set up in each Province for the purpose of planning basic development, of training African staff and of carrying out investigation and experimentation; and that the proposal to establish one central Polytechnic should be dropped. We do not support this proposal. In our opinion, the establishment of these Centres, which would be in the nature of Polytechnics, would be uneconomical in staff and would not provide the same standard of training as will be possible in the three specialist establishments (Polytechnic, Medical Training School and Jeanes Training Centre) which form part of our plans. We also consider that the necessary organisation for planning and executing development schemes already exists and is well established and that any attempt to super-impose teams or units of specialists is unnecessary and would only lead to confusion and disharmony.

5. Under the Native Development and Welfare Ordinance, 1944, an Advisory Committee has been set up in each district consisting of the Provincial Commissioner as Chairman, the District Commissioner, the Chiefs and representatives of the various technical departments. Numerous

development schemes of local application which have been prepared by these Committees have already been approved and financed by grants from the Native Development and Welfare Fund and are being carried out. These local schemes, a Schedule of which is given in Appendix XII, are designed to fit in with the more comprehensive Protectorate schemes with which this report deals and it follows, in our opinion, that the co-ordination and planning in detail of the Protectorate schemes should also be a matter for the District Advisory Committees under the general guidance of the Central Native Development Committee. In this connection, we suggest the appointment of an officer to the Secretariat with status similar to that of Assistant Chief Secretary who would be concerned entirely with the co-ordination and carrying out of the various development plans. We consider that much of this officer's time should be spent in travelling around the Protectorate in order to maintain close contact with the Provincial Commissioners and the District Advisory Committees.

6. We feel that it would be a mistake to attempt to formulate hard and fast plans for these long range schemes and that they should be flexible and subject to constant revision and adjustment from year to year by the executive officers on the spot, according to changing conditions and circumstances. For this reason, we have omitted matters of detail from some of the schemes in this report and have confined ourselves to suggesting the extent to which the existing organisation to which we have referred should be assisted in the way of additional technical staff, equipment and funds, for the purpose of implementing the general proposals outlined. We wish to emphasize here, however, that in our opinion the provision of additional technical staff will not in itself assure the success of these schemes. On the contrary, we feel that any attempt to enforce a number of new ideas and measures through the medium of teams of technical officers would inevitably tend to antagonise the native population from the outset. We attach the greatest importance to propaganda in its widest sense and consider that it should precede as well as accompany the introduction of the various schemes and be carefully planned and carried out under the directions of a specially trained officer. Chapter VI contains our recommendations regarding the setting up of a propaganda organisation. Most important of all, in our opinion, is the strengthening of the staff of the Administration, for while additional technical staff will be required for instructional and demonstrational purposes, we consider that everything will depend for the success of the schemes on the close and constant contact between the Administrative Officers and the general population, and to permit of this being done, we trust that the establishment of the Administration will be considerably strengthened.

7. Chapter XII gives a financial summary of all the recommendations in this report and our suggestions for the financing of the various schemes. The Appendices to this report give detailed estimates of the various schemes for which grants are sought, except where these have already been set out in the Interim Reports, but estimates in total in respect of all schemes covering a period of ten years are given in Appendix XIII. We wish to make it clear that the estimates throughout this report must be regarded as tentative only.

I. Education.

8. The question of education in Nyasaland was the first of the problems to be considered by us because we felt that progress in the education of the African population was an essential foundation to all our development plans.

9. In our Interim Report No. 2 we set out in detail our recommendations for a five-year education plan which may be summarised for convenience as follows:—

AFRICAN.

(a) the establishment of a training centre or Polytechnic to provide technical and vocational training;

(b) the expansion of the present activities of the Jeanes Training Centre to include a model school to demonstrate the improvements which are desired in school curricula, an experimental wing from which mass education and adult literacy schemes will be projected, if practicable, and a section designed to encourage African arts and crafts, music and dramatics;

(c) provision for Native Authorities' Schools and for schools on private estates;

(d) closer control by Government of assisted schools;

(e) increased grants to Missions to enable them to pay the African teachers in assisted schools according to uniform salary scales; to make teacher-training, like secondary education, free of any boarding or tuition fees; to make boarding fees subject to Government approval in other assisted boarding schools; to fix the fees charged in assisted day schools at a uniform rate; to give the pupils the free use of the necessary books and school materials in assisted schools; to organise school meals at selected day schools and to assist the extension and improvement of buildings for assisted schools;

(f) increased bursaries for students qualified to enter institutions beyond the stage of the local secondary schools;

(g) the expansion of the education of women and girls.

NON-AFRICAN.

(a) The improvement of local schools for young children, increasing Government assistance where necessary, and the provision of educational allowances, bursaries or scholarships for the older children to attend institutions outside the Protectorate.

(b) The provision of a separate boarding and day school for Eur-Africans.

10. Those recommendations have already been accepted and a grant of £845,000 (to cover capital expenditure and one half of the recurrent charges for five years) has been made from the Colonial Development and Welfare Vote and the necessary legislation has been introduced. It is extremely doubtful, however, whether the Protectorate will be able to bear the full recurrent charges for Education after 1949 and we recommend that a further grant of one half the recurrent charges be sought now for a further period of five years, ending in 1954, in addition to full grants for such capital works as may be necessary during that period.

11. In regard to (a) of paragraph 9, a separate scheme for the establishment of a Polytechnic was submitted with our Interim Report No. 8. The revised scheme is designed to provide for the training of candidates in all technical and professional branches, except medical and printing, not only for Government services, but also for the commercial and planting communities and the Missions. It envisages considerable development in Nyasaland in post-war years and on that assumption the Polytechnic is planned for an eventual maximum accommodation for 500 students at an estimated cost of approximately £250,000 over a period of five years. Financial details of the five year plan and of the Polytechnic scheme appeared as appendices to the respective Interim Reports but these have now been revised to allow for grants on the basis mentioned in paragraph 10 above and are shown as one statement in Appendix I. In the same Appendix provision has been included to cover a second period of five years, but the amounts shown for that period must be regarded as token figures only.

II. Public Health.

12. We fully appreciate the fact that public health is, as in the case of education, closely allied with social and economic development. Increased production, which the economic development of Nyasaland will require, will demand greater energy and physical efforts from the African population. It follows, therefore, that improvements in the general health and living conditions of the African must, in conjunction with wider education, form the basis of our schemes for the development and progress of the country.

13. With this aim in view, we submitted proposals in our Interim Report No. 3 for a five year medical plan the main features of which may be summarised briefly as follows:—

(a) The provision of a Group Hospital and Medical Training School for Hospital Assistants in the vicinity of Blantyre.

(b) The provision of adequate dispensaries for the Protectorate.

(c) The provision of a fully equipped Mental Hospital.

(d) The establishment of a new Leprosy Settlement in the North of the Protectorate and the expansion in the South of existing facilities for the care of those suffering from this disease.

(e) The carrying out of a tuberculosis survey.

(f) The provision of four new District Hospitals with Maternity and Child Welfare Centres.

(g) The provision of X-Ray apparatus and electric lighting plants at the District Hospitals at Karonga, Mzimba, Lilongwe, Kota Kota, Ncheu, Fort Johnston, Mlanje and Port Herald.

(h) The provision of a motor ambulance for each of the District Hospitals at Mzimba, Lilongwe, Dedza, Ncheu, Fort Johnston, Mlanje and Port Herald, of two ambulances at Zomba and three at Blantyre.

(i) The provision of additional European, Asiatic and African staff.

(j) The ultimate development of a proportion of the present Rural Dispensaries into District Health Units.

14. The estimated expenditure for the five year plan as shown in the Appendix to our Interim Report No. 3 has now been revised and extended to cover a period of ten years as shown in Appendix II. It will be seen that the revised estimates for the first five years provide for a considerable increase in expenditure over the original estimate given in our Interim Report. This increase is due mainly to the fact that in extending the development plan to cover a period of ten years, provision has been made for enlarging the scope of the rural dispensary system and for increasing the number of dispensaries and health units to the extent necessary to bring treatment facilities for the common ailments within reach of the majority of the African population.

15. In paragraph 21 of our Interim Report No. 3 we pointed out that the five year plan must be regarded as an essential preliminary to the development of the present Rural Dispensaries into District Health Units, but with the termination of the war and the expectation of the early release of African personnel of the East African Army Medical Corps, it should now be possible to put in hand the plans for expanding Rural Dispensaries without waiting for the completion of the Medical Training School. The employment of ex-East African Army Medical Corps nursing orderlies at hospitals would enable a corresponding number of hospital assistants and dressers to be released to take charge of the proposed health units and dispensaries, the type of work for which they have been trained, but in order to maintain the number of trained African staff necessary for a rapidly expanding medical service, decentralisation of training is essential.

16. The original five year plan provides for the rebuilding of twenty existing dispensaries, for the building of fifty-one rest houses at dispensaries and for the establishment of thirty-five new dispensaries, thus raising the total number of Government rural medical centres to one hundred and twenty-five. It will be agreed that this number is inadequate to serve a population of over 2,000,000 living in an area of approximately 38,000 square miles, and the proposals under the ten year plan provide for a total of 400 rural medical centres of which 140 would be health units

and 260 satellite dispensaries. The allocation of the additional medical centres would be a matter for careful consideration by the Provincial Commissioners in consultation with their Administrative and technical staffs.

17. In regard to these proposals, the Director of Medical Services has reported as follows:—

"In arriving at a decision regarding the number of rural medical centres required, I have been influenced to some extent by the fact that in the educational programme the plan provides for the establishment of 266 Central Schools by the end of the fifth year, and that under the present proposals there might ultimately be 400—500 Central Schools. The Joint Development Adviser has suggested that it might be convenient to assume that an equal number of Rural Health Units would ultimately be needed. I agree with this view but the necessary staff could not be trained within a period of ten years.

The pace at which the Public Health service can be expanded depends upon the availability of trained Africans. In order to obtain the output of dressers (dispensary assistants) to staff the satellite dispensaries and sanitary assistants for health units, it will be necessary to provide for their training in each province. The training of hospital assistants would continue at the Zomba African Hospital until the proposed Medical Training School, Blantyre, is ready to accept students, after which the former institution should become a training centre for male and female nursing staff. The present system of endeavouring to train men to undertake the dual duties of doctor and nurse should then be discontinued. The dresser of the future should be trained to treat the sick and to prevent disease, while the training of a nursing orderly should be directed towards turning out a capable nurse whose duties would be confined to the wards of a hospital.

There is no prospect of providing midwives in the numbers required for district health units unless the aid of certain Missions is obtained. Under an agreement with the Church of Scotland Mission, Blantyre, a bounty of £20 is paid for each midwife, trained at that institution, who enters Government service; in addition, Government made a grant to meet the cost of building an hostel to accommodate twelve pupil midwives in training. It is considered that similar arrangements should be made in the Northern and Central Provinces with the Church of Scotland Mission, Livingstonia, and the Dutch Reformed Church Mission, Mkhoma, and the estimates of the ten year plan include funds to cover the cost of erecting and equipping two hostels and paying a bounty as in the case of the Blantyre Mission.

It is impossible to predict how quickly the building programme will be carried out. The training at the three provincial headquarters should be given a high priority, and it is suggested, in connection with the building of rural medical centres, that consideration should be given to setting up a special team for this purpose. This arrangement is reported to work well in Southern Rhodesia.

The following are the more important amendments which it is suggested should be made to the original five year plan.

A. ADDITIONAL EUROPEAN STAFF.

(1) *Senior Medical Officer*—1.

The Protectorate has recently been divided into three provinces. One additional Senior Medical Officer is required for the new province.

(2) *Ophthalmologist*—1.

The treatment of diseases of the eye and the correction of errors of refraction are highly specialised work. In the absence of a Government or private practitioner experienced in this particular branch of medicine, members of the European population are compelled to seek advice in an adjoining territory. The incidence of errors of refraction in the native population is increasing, and proposals for mass and compulsory education are likely to have an adverse effect on the eyesight of both young and old.

It is proposed that this officer should be attached to the Central Hospital, Blantyre, but he would be expected to visit district hospitals throughout the Protectorate where he would be available for consultations.

(3) *Radiologist*—1.

The five year plan provides for the installation of X-Ray plants at eight district hospitals, not including Zomba and Blantyre, in the fourth year. The taking of a skiagram is a relatively simple procedure; the interpretation is what gives rise to difficulty. In addition to being responsible for the radiological work at the Central Hospital, Blantyre, this officer would be expected to visit district hospitals where plants are installed, to report on their condition and to advise the officer in medical charge. He would also report on films sent to him for interpretation.

(4) *Medical Officers*—2.

The three additional appointments referred to above would increase the number of posts to be filled by qualified officers to thirty-six for which eight reliefs were provided. Two additional medical officers would be required for relief purposes.

(5) *Nursing Sisters*—8. (including two reliefs).

During a discussion with the Consulting Architect on the layout of the Central Hospital, Blantyre, it became clear that two additional nursing sisters would be required to staff the hospital, raising the number from ten to twelve.

Three nursing sisters (Sister Tutors) would be required for the provincial training centres to be set up at:—

- (a) the proposed new African hospital in Mzimba District (Northern Province);
- (b) the African Hospital, Lilongwe (Central Province); and
- (c) the African Hospital, Mlanje (Southern Province).

The fourth is required to assist in training at the Zomba African Hospital. The nursing staff at this institution should be maintained at three after the Matron is transferred to Blantyre, on the opening of the Central Hospital.

(6) *Ward Master-Instructors (Ex-R.A.M.C.)*—5 (including two reliefs).

Three European Instructors (ex-R.A.M.C.) would be required for the provincial training schools to be set up at the new African hospital in Mzimba District, and at the Lilongwe and Mlanje African Hospitals. These three appointments would increase the number of posts to be filled to five. Two reliefs would be required.

(7) *Pharmacist*—1.

This appointment, in the sixth year of the plan, would increase the number of posts to three, one of which would be held by a Pharmacist-Storekeeper. The additional appointment is required for relief purposes and to cope with the increasing volume of stores imported for an expanding service.

(8) *Entomological Field Worker*—1.

It is anticipated that the Entomologist appointed in the third year of the plan will require a field worker in the sixth year.

(9) *European Clerk*—1.

This appointment has been included in the sixth year of the plan. Additional clerical assistance might be required earlier.

B. ADDITIONAL BUILDINGS.

(1) *Lilongwe.*

- (a) House for Wardmaster Instructor (ex-R.A.M.C.).
- (b) Hostels for student dressers and Sanitary Assistants.

It is proposed that the hostel should be built in two sections, one to accommodate 24 probationer dressers (12 first year and 12 second year) and the other 12 probationer Sanitary Assistants (6 first year and 6 second year). The smaller section should be sited so that it could be used at a later date as an hostel for women in training or as staff quarters.

(2) *Livingstonia*—Church of Scotland Mission.

Hostel for pupil midwives.

(3) *Mkhoma*—Dutch Reformed Church Mission.

Hostel for pupil midwives.

(4) District Health Units (140) and Satellite Dispensaries (260).

(a) Thirty-five new dispensaries have been included in the five year plan making a total of 125. In the estimates of the ten year plan provision has been made to expand 107 of these into health units and to provide 33 complete health units.

(b) Out of 125 dispensaries, 18 are to remain as such; 242 additional dispensaries have been included in the ten year plan, raising the total to 260. It is not proposed to provide quarters for the servants employed at the latter.

(5) *Mzimba*—at Provincial Headquarters.

- (a) House for Senior Medical Officer.
- (b) Extending the nursing sisters' quarters provided in the five year plan to accommodate a Sister Tutor.
- (c) House for Wardmaster-Instructor (ex-R.A.M.C.).
- (d) Office for Provincial Medical Officer.
- (e) Hostel, as detailed in (1) (b).

(6) *Mlanje.*

- (a) Extending the nursing sisters' quarters provided in the five year plan to accommodate Sister Tutor.
- (b) House for Wardmaster-Instructor (ex-R.A.M.C.).
- (c) Hostel as detailed in (1) (b).

(7) *Fort Johnston*—Hospital.

The estimates of the five year plan include a sum for additional African staff quarters at, and extensions to, the existing hospital. It is considered that it would be inadvisable to incur expense on extending the hospital on its present site. The hospital is badly sited on the banks of the river where it is liable to flooding when the level of the Shire rises;

it is inconveniently situated, from the native point of view, in the European residential area; the site is cramped, and only linear extension is possible, a layout which adds to the difficulties of supervision.

Provision has been made in the estimates of the ten year plan for the hospital to be rebuilt on a different site.

(8) *Blantyre.*

(a) House for Pharmacist.

(b) House for Field Worker.

C. EQUIPMENT.

(1) Ambulances and lorries.

(a) The ten year plan provides, in the sixth year, for ambulances at Kota Kota and Karonga, and for the replacement of six of the original ambulances.

(b) Sanitary Inspectors employed on district work would be expected to travel extensively. Their commencing rate of pay is low and it would seem to be unreasonable to expect them to mortgage their future in order to purchase motor transport. In a number of other territories, health inspectors are provided with Government transport. Provision is made in the ten year plan for the purchase of 16 vans for Health Inspectors during the first six years, and for thirteen replacements in the following four years."

18. We endorse these proposals and we have included provision accordingly in the estimates shown in Appendix II.

III. Water Supplies.

19. We attach great importance to the need for the early carrying out of an extensive programme of operations for providing proper water supplies for the population, not only as part of the health scheme described above for raising the general standard of health and sanitation, but also for the purpose of opening up new land for settlement and for the expansion of agricultural production.

20. We understand that between 1930 and 1940 a sum of approximately £75,000 was spent on the development of water supplies throughout the Protectorate. Although much was done during that period to relieve the seriousness of the water supplies situation, much more remains to be done. We do not propose to suggest the exact areas in which new water supplies should be provided: that is a matter for the local authorities on the spot and we propose to confine our recommendations to the organization which might be set up for the carrying out of an extensive programme for the provision of new boreholes, wells and dams throughout the Protectorate over a period of ten years.

21. We recommend that in each of the three Provinces there should be a Water Supplies Unit under the charge of a Geologist consisting of one Drilling Team, one Dam Construction team and two Well-sinking teams. We suggest also that there should be a fourth Drilling Team which would be engaged on work for the public. The other teams would also be available for private work when their official programmes permitted. All the Units would be under the direction and control of a Principal Geologist and each team would be under the charge of a European Driller or Foreman. Details and estimates of the staff suggested are shown in Appendix III. The Principal Geologist has not been included on the assumption that he will be a permanent member of the Protectorate staff. This applies also to the European posts of Storekeeper Draughtsman and Clerk which will be necessary for this scheme. The estimates under Personal Emoluments are tentative only, but we trust that the salaries will be sufficiently attractive to ensure against the resignation or transfer of officers to more remunerative appointments as we consider it important that continuity of control should be maintained and that the knowledge and local experience gained should not be lost during the operation of the scheme.

22. Estimates of the plant and equipment for the Water Supplies Units are shown in Appendix III and should also be regarded as tentative. They allow for the sinking by each drilling team of from four to seven boreholes a year and for the construction by each well-construction team of approximately fifteen wells a year. Provision has been included for geophysical apparatus and instruments as we consider that geophysical methods of locating underground water supplies should form part of the routine geological examinations and we recommend that the officers appointed should have knowledge and experience of this method of prospecting for water. We are advised that the "Edeco" type Portable Cable Drilling Rig. would be suitable, but we suggest that the officer appointed to undertake the scheme should be fully consulted regarding the plant and equipment to be ordered and should, if necessary, first visit other territories or countries to study water supply methods in use elsewhere.

23. We consider that the organisation proposed above would be suitable and adequate for the purpose of carrying out within a period of ten years a programme of work which would provide the additional water supplies required throughout the Protectorate in the interests of health and agricultural development. As already stated, we do not propose to suggest details of the work to be carried out. We consider that this is a matter for consideration by the officers most closely concerned and that a plan of operations should be prepared year by year by each Provincial Water Supplies Unit, under the directions of the Principal Geologist, in collaboration with the Provincial Commissioner and the District Advisory Committees. This method would ensure co-ordination of the year's programme of work with the various other social and economic development plans. We regard it as important that the need for pure water supplies and for the proper care and maintenance of the equipment provided should be stressed by the propaganda organisation.

24. As regards the provision of pure water supplies, including boreholes and wells on freehold or leased land, we advise that when a private owner of land executes a waterwork which is of benefit to the neighbouring general public it should be recognised in principle that the private owner concerned should be able to apply for a capital or a recurrent grant from Government, or from other private owners or from the Native Treasury concerned, or from all three.

25. We consider that this scheme, the financial implications of which are shown in Appendix III, is a suitable project for a grant from the Colonial Development and Welfare Act.

IV. Conservation and Development of Natural Resources.

(a) AGRICULTURE.

26. We appreciate that agricultural development forms the keystone of the whole scheme for the Protectorate's future development and prosperity and that only by increasing the economic capital assets of the country can an improved standard of living for the African population be built up and maintained.

27. We have read with interest and appreciation the report on agricultural development by the Director of Agriculture and the memoranda attached to it which are reproduced in Annexure II. We agree generally with the recommendations contained therein and in particular we endorse the Director's conclusion that no plan for agricultural development can be rigid and definite and that detailed plans must be worked out in consultation with the local planning committees. In view of the comprehensive nature of this report and its enclosures, we see no necessity for us to elaborate at length. We wish, however, to submit our comments and recommendations under the following headings.

SOIL CONSERVATION.

28. We agree that effective measures for preventing soil erosion must form an essential part of any programme for agricultural development and we feel that there is no need for us to stress the urgent necessity for a comprehensive soil conservation scheme as part of the general agricultural plan. For many years past, soil conservation work has been undertaken throughout the Protectorate, but has been hampered by lack of funds and, in recent years, by lack of staff. A number of local soil conservation schemes are now being carried out with funds provided from the Native Development and Welfare Fund. These undertakings will fit in with a general scheme for the whole Protectorate.

29. The memorandum on this subject in Attachment II to Annexure II contains proposals which, in our opinion, provide a simple, flexible and practical scheme and we recommend that they be accepted and put into operation as soon as the necessary staff can be obtained. Certain legislation will be required to make the scheme fully effective and we understand that this is at present under consideration. We suggest that the Officer appointed to take charge of this scheme should be given the opportunity of seeing and studying the methods of soil conservation work being used in other territories.

30. We consider it important that the Geological Department should be kept fully acquainted with the measures being carried out under this scheme with a view to complete liaison between the departments concerned in the general conservation and use of water supplies.

FOOD CROPS.

31. We consider that the first and most important task in Nyasaland is the production of a sufficiency of good food for all and we support the recommendations in the report of the Director of Agriculture regarding the measures which should be adopted to effect this, namely, the use of reserve crops, dry season cultivation, the introduction of higher yielding varieties of food crops, the reduction and elimination of plant pests and diseases, the use of improved cultural practices, the better storage of food crops, the more efficient use and distribution of labour by the introduction of maize mills and the use of agricultural implements and carts drawn by oxen. We suggest that all these measures should be encouraged by practical demonstration in the villages. If their advantages can be proved to the natives on the spot, there need be little doubt that they will be readily adopted.

ECONOMIC CROPS.

32. We agree that the raising of the general standard of living of the African population must depend mainly on increased production of economic crops and that the standards of production, processing and marketing must be improved if agriculture is to become a counter-attraction to emigration. We entirely agree with the Director of Agriculture as to the desirability of stabilising prices, if practicable, for obtaining balanced development of production, but we cannot suggest the means by which this can be accomplished as prices are mainly governed by external and international markets.

33. As stated in our Interim Report No. 4, we consider that at present tobacco and cotton should be regarded as the main export crops for Africans. At a later date, tung may become a complementary or co-operative European and African crop when its production by the proposed Tung Development Company, to which we refer in paragraph 86, takes place.

84. In regard to the local manufacture of sugar, we consider that the growing of sugar cane and the production therefrom of a cheap sugar product should be encouraged as a village industry and that to this end the possibilities of irrigating the Palombe plain should be investigated.

85. In regard to the expression of oil from oil seeds, we consider that it would be desirable to encourage the local expressing of oil as a secondary industry, especially in view of the importance of retaining oil-cake for cattle food and manurial purposes.

TUNG DEVELOPMENT SCHEME.

86. As a tung producing country, Nyasaland has made a good start, having nearly 8,500 acres already planted up, but if the industry is to be established as a staple one, it must be developed on a scale that will enable Nyasaland to influence world markets in tung oil. For this purpose, an ultimate annual production of 10,000 to 15,000 tons of oil would, in our view, be the minimum.

87. There is an area of Native Trust Land in the Northern Province of approximately 150,000 acres of land which is reported to be suitable for tung production and we strongly recommend that part of this land should be made available at once for the rapid development of this industry on a large scale. We are aware of the provisions of the Nyasaland Native Trust Land Order in Council, 1936, but the area in question is only sparsely populated and its opening up by the introduction of this industry would afford the Africans in this and in the surrounding areas a variety of benefits.

88. We suggest that a local Development Company be formed for this purpose in which Government would be a shareholder and that 75,000 acres of the land referred to should be leased to the Company for a period of 99 years at a pepper-corn rent until production is established. We suggest also that it should be the policy of the Company to stabilise communities of African employees in its own area and that, when the Company has become profit-earning, a system should be established whereby all classes of employees would participate in the profits.

89. We feel that it would be in the interests of the industry as a whole if the whole of the tung oil production of the country were to be exported under a system of Government grading and marking and to be marketed co-operatively, and that the Development Company should co-operate to that end with the other sections of the industry. It is understood that the majority of the existing industry, which is privately owned, favour immediate legislation to that effect.

40. We suggest that Government's minimum shareholding should be 25% of the capital issued and that the necessary funds should be provided in the first instance from the Protectorate's surplus balances, pending subsequent application for a grant under the Colonial Development and Welfare Act.

MARKETING.

41. We note that the Director of Agriculture has suggested in his report that it might be more satisfactory for all African grown produce other than cotton, tobacco and rice to be purchased by one Produce Marketing Company rather than by a number of small produce dealers as at present. While we appreciate some of the advantages of having one buying organisation, we foresee also certain difficulties and objections to a Marketing Company holding a monopoly and we feel that the suggestion requires careful consideration. In our opinion, the most beneficial arrangement from the point of view of the producer would be the purchasing and marketing of his produce by co-operative societies and we recommend that steps should be taken as soon as possible to foster the co-operative movement. The expansion and improvement of the present communications and transport facilities which we recommend in the following Chapter will, in any event, enable produce to be marketed more easily and at a lower cost to the grower.

42. We do not agree with the suggestion in Part III D of the Memorandum in Attachment II to Annexure II that a collective system for marketing tea should be adopted. Present arrangements for marketing tea are very long established and we consider that any collective system would be quite impracticable.

ANIMAL HUSBANDRY.

43. There is clearly much scope for a better and wider use of stock and of animal products both as an economic proposition and as a means of improving the African's diet and we support the proposals to this end contained in Annexure II.

44. The following Section in this Chapter deals with stock improvement, but we wish here to stress our view that a tsetse-fly control scheme on an inter-territorial basis must be an essential preliminary to any scheme for the improvement of the livestock industry. We consider also that a pasturage survey is a prerequisite of any such scheme.

RESEARCH.

45. We support the following recommendations of the Director of Agriculture regarding research:—

- (a) the appointment of a Plant Breeder to carry out investigations into varieties of food crops, soils, etc.
- (b) the establishment of a Tobacco Research Station;
- (c) the expansion of the Tea Experimental Station at Mlanje;
- (d) the extension of the Tung Experimental Station;

(c) the carrying out of experiments in the growing of flue-cured tobacco in the Kasungu area;

(f) the establishment of an investigational farm on the Vipya Highlands in the Northern Province;

Details of (b), (c), (d) and (e) are given in Appendices 2, 3, 4 and 5 respectively to the Director of Agriculture's report in Annexure II and of (f) in paragraph 88 of that report.

46. Estimates of costs of the Director of Agriculture's proposals for agricultural Development are given in Appendix IV.

(b) STOCK IMPROVEMENT.

47. The Chief Veterinary Officer and the Director of Agriculture have expressed the view that the improvement of cattle in the Protectorate can only be effected with any assurance of satisfactory results in the Northern and Central Provinces by the method of selection from native stock in the first instance and that the importation of stock should only be considered when the local stock has been improved up to a certain standard. The reason given for this is that tick borne diseases are endemic over the whole of the Northern and Central Provinces and that indigenous cattle have from long residence under such conditions acquired an active immunity to these diseases. The introduction of bulls imported from countries where such immunity has not been acquired would of necessity lower considerably the inherited immunity of the resulting progeny. Moreover, the quality and quantity of grazing in those two Provinces is poor and limited, and the conditions under which indigenous livestock lives there is not the best suited to exogenous breeds. In the Southern Province conditions are different. Tick borne diseases are by no means so prevalent and are much more easily controlled. Furthermore, few if any of the native breeds are of pure native origin owing to close proximity to European settlers from whom the African cattle owners have been able to obtain grade bulls. The results of crossing and counter-crossing native cows with the numerous types of bulls imported by Europeans have, in the opinion of the Chief Veterinary Officer, been unsatisfactory.

48. For the above reasons, we recommend that the improvement of cattle in the Northern and Central Provinces should in the first instance be by the method of selection only, but that in the Southern Province the method of importation of a suitable type of bull should also be used. We realise that the method of selection will be a very slow one and we therefore recommend that nine stock improvement centres should be established, four in the Northern Province, four in the Central Province and one in the Southern Province.

49. We quote the following proposals of the Chief Veterinary Officer, which we endorse, for the management of these centres:—

"For each of these centres about ninety heifers and four bulls of good conformation will be purchased from local native herds. The heifers will be divided into four herds, each with its own bull. At the end of each breeding season, bulls will be changed from one herd to another so that their performances can be compared on the same cows. As one expects to have a large number of discards during the initial years, there will be no necessity to use a complicated performance index for some time to come.

The bulls will, as a rule, be penned, and cows will be brought in to the bull for service. This is necessary if records are to be accurate and will also be essential to artificial insemination programmes which it is hoped to introduce when the quality of the stock warrants it.

The heifers and bulls will be retained at the farms; after this requirement has been met and after unsuitable beasts have been sold for slaughter, the surplus stock will be available either for sale to natives or for distribution under a controlled scheme. Requests for these cattle from natives willing to improve their management and to have their own bulls castrated will be given prior consideration.

These farms will not claim to be demonstrations; they are intended to produce improved stock in the most efficient way possible without regard to the general application of the system of management. For instance, all buildings will be made of permanent materials to avoid the necessity of frequent replacement and the enormous waste of time and energy involved in putting up new buildings. It is also recognised that while native owners cannot be expected to grow fodder crops some supplementary feeding will be desirable on the farms if their efficiency is to be maintained. The best cows should be fed so that the maximum number of healthy calves may be obtained from them. The breeding bulls should be fed so that they may serve a large number of cows without losing fertility.

It must be emphasized that the great majority of the cattle will live under natural conditions, and without supplementary feeding. No calves will be specially fed. In this way, the new stock will be tested against the environment they may expect when sent out in the Districts, and unfit animals will either fail to survive or be eliminated on their performance records.

Some of this supplementary feed in the form of hay and silage can be provided by elephant grass planted on the edges of streams in a manner which is not impossible for future native practice. The few tons of other feeds can be purchased locally much more cheaply than they could be produced on the centres. The non-production of fodder crops on the centres will also economise on the Officer's time in supervision of large labour gangs, and allow him more time for his real work of cattle breeding and pasture improvement, and also allow of some touring around the villages.

This question of pasture improvement will be emphasized at all the Centres for it is obvious that grass land will always provide the basic food for native cattle. Our grazing system therefore will be designed to conserve our pastures and so change their botanical composition so that they will become more palatable for cattle and more productive of herbage.

Briefly, we will aim at stopping bush encroachment of pasture lands, increase grass cover and so prevent erosion. It is also hoped that the bearing capacity of pastures will be increased.

Boundary fencing will be necessary at all Centres and should be provided as soon as war conditions permit. Until that time hedges will be planted of sisal, *Euphorbia* *sp.* etc.

It is generally recognised that the average indigenous cattle are, even by native standards, poor milk producers and have small carcasses. The aim of the present scheme is to increase the milk yield of the cows by disseminating improved bulls bred at the various Centres. Evidence is presented to show that worth-while results can be expected in a comparatively few years and that the milk yield of cows can be increased without lowering their resistance to disease or to the rigours of the environment.

These Centres are not essentially demonstrations in animal husbandry with application in village economy. Nevertheless, we hope to maintain native interest by frequent visits of chiefs and headmen. For this reason, European methods of housing and management will not be imitated, but rather the Ankonde methods which are a step above the practices of most tribes in this country, and have stood the test of time for very many years. The essentials of this method are the essentials of good animal husbandry—a clean floor, and a docile, well-fed cow. The manure which accumulates outside the byres will be conserved for use on the land. No estimates are therefore included for European type fittings.

To carry this policy into effect some organisation must be created other than that existing at present and it is considered necessary that each Centre should be in the charge of an European Livestock Officer for the keeping of all records of breeding and milk yields, the training of the African staff and for the general management of the Centre.

The procedure at the Centre in the Southern Province will be the same but with the addition of imported stock. The most suitable breed would probably be the Indian Zebu-Hissar.

In addition to cattle, it is proposed to keep at all these Centres imported goats, pigs, poultry and possibly sheep for production and distribution on sale.

50. In regard to the above proposals for the improvement of cattle by selection, the Chief Veterinary Officer has stressed that the elimination of scrub bulls must be regarded as an essential part of the scheme and we therefore recommend that the necessary administrative action should be taken for this purpose, but that it should be preceded by intensive propaganda.

51. We suggest that when imported stock is being ordered by Government, arrangements should be made for the requirements of the general public to be ordered at the same time and imported under Government supervision.

52. Estimates of the above scheme are shown in Appendix V.

(c) FORESTS.

53. Forestry policy for the future must clearly be planned as an integral part of the general programme for the development of the country's resources and for the preservation of natural vegetation in catchment areas and on lands which are particularly liable to erosion or to desiccation.

54. In our Interim Report No. 6 we outlined the general position relating to forestry in Nyasaland and made recommendations for its preservation and future development including a ten year plan for the planting up of 16,500 acres for Native forestry and for increasing the production of saw timber for European and industrial needs from 105 to 150 acres a year.

55. The Secretary of State has since suggested that the ten year plan should be spread over a period of fifteen years. We agree with this suggestion and we have accepted the Conservator of Forests' proposal to re-arrange the original planting programme so as to provide for a progressive increase in the planting acreage every three years whereby 5,100 acres would be planted in the first seven years and the balance of 11,400 acres during the remaining eight years. In regard to the planting of saw timber, the Conservator of Forests has informed us that since our Interim Report was written the annual planting has increased to 125 acres and that there is no necessity for financial provision to be included in this scheme for the planting of an additional 25 acres a year.

56. Estimates of the cost of the revised scheme and of the revenue to be derived from the sale of timber are given in Appendix VI.

(d). STABILISATION OF WATER LEVEL OF LAKE NYASA.

57. We have considered the report on this subject by Mr. F. E. Kanthack, C.M.G., and we strongly recommend that the measures he has proposed for stabilising the lake level be adopted in view of the many advantages to be gained, the more important of which are:—

(a) Lake transport could be greatly improved by the erection of permanent jetties with facilities for the mechanical handling of cargo. This is an important consideration in connection with the future economic development of the country. At present, cargo has to be man handled from beach to barge, sometimes over an intervening stretch of shallow water through which the labourers have to wade. Labour for this work is already difficult to obtain and may be expected to become more difficult as the standard of living of the African improves.

(b) Agriculture on the lake shore would no longer be hampered by periodical flooding and much fertile land would become permanently available for the growing of rice and other crops. Increased agricultural production would thus result.

(c) Health conditions on the lake shore could be greatly improved by anti-malarial work in swamps where drainage and other action to destroy mosquito larvae is at present ineffective.

(d) The fishing industry, which is of the greatest importance for the food supplies of the country, would greatly benefit.

(e) The amenities of the beaches for villages, hotels and private plots could be greatly improved.

(f) Navigation on the upper and lower stretches of the Shire River would be simplified and any system of planned agricultural development in this area would thus be greatly assisted.

(g) The stabilisation of the lake level by means of a barrage would be a preliminary step towards the implementation of any hydro-electric scheme.

(h) The construction of a barrage at Liwonde would save the very expensive construction of a bridge over the Shire River. The road through Liwonde is one of the main communications with the north and is important administratively, commercially and strategically. The present ferry is expensive to maintain and causes much inconvenience to traffic.

58. For the above reasons, we consider that the construction of a barrage with sluice gates as proposed in Mr. Kanthack's Report would be fully justified. In our opinion, this is a suitable project for a grant from the Colonial Development and Welfare Vote and we have included provision of £160,000 in the financial summary in Appendix XIII.

(e) CONTROL OF FLOOD WATER IN LOWER RIVER VALLEY.

59. We consider that the problem of controlling the flood water in the Lower Shire Valley should be investigated as a logical extension to the project for the stabilisation of the lake level, partly for the purpose of eradicating the Red Bollworm menace, but more especially in the interests of agricultural production generally, and we recommend that the necessary survey be undertaken as soon as possible.

60. Until the survey is completed we are unable to suggest the amount of the grant which would be required to carry out whatever measures may be recommended for controlling the flood waters in the Lower Shire Valley, but we have included a token figure of £250,000 for the purpose in Appendix XIII as part of the general cost of our post-war plans.

V. Communications.

(a) ROADS.

61. A good system of road communications is an essential part of the general plans for the development of the country. Many of the existing roads need to be improved in order to take normal heavy traffic engaged in the movement of produce and a number of new district roads are required in productive areas to act as feeders to the main roads and to the lake ports.

62. In Appendix VII is given a programme of road construction work which we consider will meet the minimum needs of the Protectorate for the evacuation of produce and for the general development of the country and which, we suggest, should be carried out over a period of ten years. The work to be carried out will provide for a standardised permissible axle load of six tons on all main roads. We wish to emphasize that this programme is by no means exhaustive and that as development increases further road construction and reconstruction will undoubtedly become necessary, not only for the transport of agricultural produce but also in other directions—to enable district ambulances, postal vans, propaganda cinematograph units and water supplies units to travel extensively, rapidly and regularly.

63. It will be seen that the proposed programme is under three headings :—(i) New Roads, (ii) Tar-macadaming certain existing roads and (iii) Improvements to certain earth roads. The main item under (i) is the proposed new road of approximately 44 miles at an estimated cost of £88,000 from the proposed new lake port terminal at Monkey Bay to the Railway. This is one of the recommendations in the Rooke Report. The other feeder roads recommended in that Report have also been included in this programme. The proposed new roads to the Mlanje Plateau in the Southern Province and to the Nyika heights in the Northern Province are suggested as inducements to tourist traffic. The latter road would also be the means of opening up approximately 300 square miles of almost uninhabited land which might be brought into habitation if there were reasonable access to it. We consider that these two proposed roads should be given a low priority and that the estimated cost of constructing both, namely £75,000, should be regarded as an unallocated sum to be used either for these two roads or for such other roads as may be considered necessary.

64. The roads shown under (ii) are all important roads which are subject to heavy traffic and at times of the year they become badly cut up and in some cases impassable. The annual upkeep of these roads entails heavy expenditure and the tar-macadaming of them is advocated as an economy in upkeep and in transport running expenses which in turn should result in a reduction in road transport rates.

65. The roads shown under (iii) are mostly district roads and the work proposed is general surface improvements and construction of more permanent bridges.

66. The cost of carrying out this programme is estimated at £1,075,000 and we have included this amount in the general financial statement in Appendix XIII.

(b) ROAD TRANSPORT.

67. The programme suggested above for the improvement and extension of the present road system will afford the means for road transport to develop. The existing road transport service is, in our opinion, inadequate and unsatisfactory and we recommend that the following proposals be adopted:—

(i) the present Licensing Board should be continued for the purpose of controlling road transport, but a closer control should be exercised by the periodical revision of maximum rates designed to foster efficiency and to eliminate the operation of inefficient transporters;

(ii) the Nyasaland Railways Ltd. should own and operate road feeder services to the railway and to lake ports and the rates and charges on these services should be based on the principle of service, with the object of developing the country's resources and providing more traffic for the railway; it should not aim at financial profit for itself;

(iii) tenders should be invited for the operation of a passenger omnibus service by a single Company throughout Nyasaland on a controlled monopoly basis. Tenders should not be restricted to Nyasaland residents.

68. These proposals accord with the recommendations in the Rooke Report (see (c) below) in which a sum of £100,000 is recommended for the provision of Railway road feeder services. We assume that whatever amount is required for this purpose will be provided by the Railways.

(c) RAIL TRANSPORT.

69. In our Interim Report No. 5 we commented on the effect of high railway rates upon African development and upon the large scale temporary emigration of Nyasaland natives to the South. We remarked that we were impressed by the urgent need for an improvement in the standard of living and the purchasing power of the African which we felt would be furthered by cheaper rail and other transport rates. We felt, too, that these would foster production and the development of the country.

70. The Interim Report was examined by the Secretary of State and his Advisers in the Spring of 1944 in consultation with the Governor and certain Railway Directors, as a result of which the Secretary of State invited Mr. C. E. Rooke, C.M.G., the Nyasaland Government representative on the Boards of the Nyasaland and the Trans-Zambesia Railways and former General Manager of the Nigerian Railways, to visit Nyasaland to conduct an examination on the spot.

71. His terms of reference were:—

(1) To examine and advise on the Rates Structure of the Railways serving Nyasaland with particular reference to the incidence of rates on the principal Imports and Exports carried by the Railways and on the development of the Protectorate.

(2) To consider and report on the desirability, practicability or otherwise of establishing any local machinery to advise on Railway and Road Transport charges.

(3) To advise on the means by which Road transport might be developed and Road freight rates reduced.

(4) To take into account the views expressed by the Post-War Development Committee in their Report both on the Railway and the co-ordination of commercial motor transport and the development of Road and Rail facilities—the future road programme and the development of Lake Port facilities.

72. Mr. Rooke arrived in Nyasaland on the 14th October, 1944, and left on the 10th January 1945. His report was received in this country on the 10th May, 1945.

73. The recommendations contained in the Report are still under consideration by Government, in consultation with the Secretary of State, although, as will be observed from paragraph 63 and 77, some of the proposals relating to road and lake transport have already been accepted by the Post-War Development Committee.

74. The Railway and Lake recommendations do not involve any expenditure by Government and accordingly do not figure in Appendix XIII. The Railway Companies will be responsible for the financing of these proposals.

75. The financial implications of Mr. Rooke's railway proposals, to be met from Railway funds, are:—

APPROXIMATE.		Per annum
		£
1. <i>Loss of Revenue</i>		
Goods Rate modifications and re-classifications	16,270	
Passenger fare reductions	4,500	
Rate reductions, recently made	6,000	
Flattened taper on Lake Rates	500	
Loss on Lake Services when fully equipped and staffed, probably reducible	5,000	£ 32,270
		32,270
2. <i>Increased Expenditure</i>		
Provision for Contributory Pension Scheme	10,000	
Increased Working Expenditure (general)	15,000	
Annual contribution to rates equalisation reserve fund (mainly Tobacco, Tea and Cotton)	30,000	55,000
		<u>87,270</u>

3. Capital Adjustments to meet 1 and 2.

Moratorium on the Bridge Income		
" Bonds (for ten years) ...	35,556	
Moratorium on the Northern Extension		
" B " Income Debentures (for ten years)	2,884	
Purchase by Government and Conversion		
of 5% " A " Debentures to 3½% at 50 years,		
saving ...	18,144	
Conversion of the Trans-Zambesia 6% to		
3½% already approved, saving ...	96,350	92,934
Net Annual Saving to Railways		<u>5,664</u>

(d) LAKE TRANSPORT.

76. Improvements and extensions to the existing lake transport services must be regarded as complementary to the proposals above for increased road transport facilities.

77. The following requirements have been recommended in the Rooke Report and we support the recommendation:—

New Terminal Port at Monkey Bay	72,300
Sheds, Jetties and Storage	9,150
Tugs and Launches	10,000

78. The practicability of erecting jetties, which we regard as essential at all lake ports for the efficient operation of lake transport services, must depend on the stabilisation of the lake level which we have already recommended.

79. We assume that the provision of the necessary funds for carrying out the above recommendations, if accepted, will be a matter for the Railways.

(e) AIR TRANSPORT.

80. There is a growing demand in Nyasaland for increased air transport facilities and there is no doubt that a frequent and efficient service is of great importance to the general development of the country. We make the following recommendations for the development of aviation in Nyasaland.

INTERNAL SERVICES.

81. We understand that it is proposed to set up a Commission for the purpose of operating a jointly owned air service for Southern Rhodesia, Northern Rhodesia and Nyasaland and that the estimated capital required to provide and maintain the service is £500,000. We strongly recommend that Nyasaland should participate in this scheme and we suggest that an appropriate ratio for the subscription of the necessary capital might be Southern Rhodesia 10, Northern Rhodesia 7 and Nyasaland 3. In this ratio, Nyasaland's contribution would be £75,000. We consider that this contribution should be met by a grant from the Colonial Development and Welfare Act.

82. We envisage the necessity of increasing the frequency of the present service between Salisbury and Chileka from three times a week to probably a daily service and we agree that on the regular service between Chileka, Zomba and Lilongwe additional calls should be made at Salima and Monkey Bay by request. We understand that the direct service from Chileka to Beira is to be restored.

83. We envisage also a considerable increase in the use of aircraft locally for Government, commercial and private purposes. It is anticipated that all these requirements not at present served by the regular services will be met by a charter plane or planes which, we understand, will be stationed at Chileka and will be available for internal flights only, any long distance journeys being undertaken by charter from Salisbury.

84. We feel that it might be of advantage to Nyasaland if the proposed Johannesburg-Nairobi regional service were to be routed through Nyasaland once a week in each direction and we suggest that this be considered. It is not possible to estimate even approximately what financial contribution this territory would be required to make to this service, but we have included a token figure of £1,000 in the estimates in Appendix VIII.

AERODROMES.

85. The aerodromes to be maintained for the operation of the Protectorate's regular air services are Chileka, Zomba and Lilongwe.

86. We understand that no other suitable land more central to Zomba and Blantyre can be found and that Chileka must be retained as the main air port. As such, it will be used by the Central African Air Service for its regular and charter services and possibly by the Regional Service. It is possible also that foreign air services may require the use of it as an intermediate stop.

87. We have been advised that on account of its configuration, it is not possible for the Chileka aerodrome to comply with the Class II standard laid down by the Southern African Air Transport Conference, but that by extending its runways and by providing the necessary buildings and navigational facilities it can be made to conform for all practical purposes with Class C, Inter-state Airport, requirements as laid down by the Chicago Air Conference.

88. In order to effect this, we recommend that improvements be carried out to the existing runways so as to provide three paved (tarmacadam) runways of 1,700 yards by 80 yards and that the following facilities be installed:—

- (a) Terminal building
- (b) Airport lighting
- (c) Hangar
- (d) Workshop
- (e) Fuel Store.

89. We consider that the Zomba aerodrome should be brought up to all weather standard and we recommend that laterite runways should be provided. Other facilities required are a hangar and an office and waiting room. It has been assumed that it will be possible to obtain hangars from war stocks at a nominal figure.

90. We understand that the Lilongwe aerodrome does not need surfacing and that the only requirements are plant and a fuel store.

LANDING GROUNDS.

91. We recommend that landing grounds at the following places should be maintained for operational reasons (as emergency landing grounds or for occasional traffic purposes) and for administrative purposes to facilitate access to district headquarters:—

Port Herald	Dowa
Chikwawa	Namitete
Luchenza	Kota Kota
Monkey Bay	Kasungu
Fort Johnston	Mzimba
Balakas	Chintechu
Dedza	Karonga
Salima	Fort Hill
	Likoma

92. A token sum of £5,000 for carrying out the necessary improvements to these landing grounds has been allowed for.

STAFF.

93. With the development of local air services as outlined above, it will probably be necessary to appoint a whole time officer in Nyasaland to be responsible for all aviation matters, but we suggest that this matter be left in abeyance pending further developments in the arrangements for joint air services for the three territories. Assuming, however, that such an appointment will be necessary, we have included provision in the estimates in Appendix VIII. Provision has also been made for a European clerk to assist this officer and for a ground engineer at Chileka.

METEOROLOGICAL SERVICES.

94. We understand that Government has accepted the proposal for the creation of a joint meteorological service for Southern Rhodesia, Northern Rhodesia and Nyasaland under the control of the Southern Rhodesia Meteorological Service with headquarters in Salisbury and that it is considered that a staff of one or possibly two Europeans and fifteen Africans will be required in Nyasaland to carry out the meteorological duties at Chileka and at twelve sub-stations. Nyasaland's annual contribution to the cost of this staff would amount to approximately £1,200.

TELECOMMUNICATIONS.

95. We are informed that it is essential for efficient and simple radio-telephone equipment to be installed at Chileka, Zomba and Lilongwe aerodromes and possibly at some of the more important administrative centres. We understand that the type of apparatus now in use by the Southern Rhodesia Air Services at Salisbury is highly efficient, is simple to operate and is inexpensive.

NYASALAND AERO CLUB.

96. In view of the considerable assistance which Government has received in the past from the Aero Club in cases of emergency and of the desirability in our opinion of encouraging private flying, we consider that Government would be justified in paying the Club an annual subsidy on a diminishing basis to enable it to purchase new planes and to continue its activities until it is in a position to maintain itself. We accordingly recommend a subsidy of £1,500 for the first year, subsequent subsidies to be considered annually.

97. Details of the expenditure contemplated under the various headings above are given in Appendix VIII.

(f) POSTAL, TELEGRAPH AND TELEPHONE SERVICES.

98. We consider that the extension of the postal, telegraph and telephone services is as essential to the general development and progress of the Protectorate as that of the other forms of

communication already referred to and for that reason we suggest that the question of immediate revenue from these services should not be a first consideration.

POSTAL.

99. In our Interim Report No. 5 we recommended the building of 36 new Post Offices of varying size and housing for staff at the respective costs of £20,000 and £21,000.

TELEGRAPHS AND TELEPHONES.

100. We have reviewed the proposals in our Interim Report and now recommend that extensive improvements and development of the present telegraph and telephone system be undertaken in order to provide telegraph communication to all centres in the Protectorate, telephone communication to the majority of centres, and telephone trunk communication to the Southern neighbouring territories. Details and estimates of the programme of work proposed, which we suggest be spread over a period of five years, are given in Appendix IX. We make no attempt to justify these proposed extended services on the grounds that they will be economic immediately, but from past experience we consider that they will be justified. It is also the case that without adequate and rapid means of communication throughout the Protectorate, the utility of the district ambulances, which it is proposed to provide as part of the plan for extending health services (vide paragraph 13(h)), would be largely negated.

(The Financial Secretary and Mr. Lee were unable to agree with some of the telephone lines suggested in Appendix IX. An estimate of telephone revenue produced by the Postmaster General showed that, in the fifth year after the completion of the scheme the total revenue from the new telephones (including official telephones) would be approximately £4,400.

While they agree that the question of immediate revenue from the telephone service should not be a first consideration, they consider that it must be an ultimate consideration. Alternatively, if the argument is that telephones should be installed in these sparsely populated areas for the convenience of the public they consider that the public ought to pay for the installation, including the cost of the line.

Interest alone at $3\frac{1}{2}$ per cent. per annum on the total capital cost of the telegraph and telephone lines suggested amounts to £4,200 per annum and maintenance would probably cost a great deal more, apart from operational costs.

They think that the possibility of using cheap but efficient wireless sets in outlying districts should be further explored before the British taxpayer is asked to finance the proposed scheme).

WIRELESS.

101. We understand that the present wireless installation is adequate to deal with commercial traffic and to meet aeronautical requirements at the Chileka and Zomba aerodromes and also for providing wireless communication with the Lake steamers. The provision of additional wireless equipment for certain other aerodromes in the Protectorate has been included under the heading of Air Transport.

BROADCASTING.

102. We have revised the view expressed in our Interim Report No. 5 that a broadcasting station is necessary in Nyasaland at present. This matter is dealt with under Chapter VI on Public Relations.

VI. Public Relations.

103. In our introductory remarks to this report we stated that we attached the greatest importance to the use of propaganda in its widest sense in introducing the various development schemes. The value of the cinema and of wireless broadcasts as educational methods is now fully recognised and their appeal to the African is well known. We wish to stress our view that full advantage should be taken of these methods in order to ensure the successful initiation and carrying through of new measures of development and we recommend the establishment of a propaganda department as a branch of the Secretariat under the charge of an officer specially trained for the purpose. The main duties of this officer would be to plan and carry out propaganda, not only of an official nature on behalf of the various departments but also of a general nature, and we suggest that he should be assisted in this respect by an advisory board comprised of officials and unofficials. He would need to have an assistant who would specialize in such duties as vernacular translations, the preparation of broadcasting scripts and articles for publication and the care of a film library.

104. It will be important for the Public Relations Officer to collaborate closely with the Provincial Commissioners and their District Advisory Committees in arranging propaganda programmes in connection with development and we recommend that each Province should have its own cinema van and operating staff.

105. We consider that it would be uneconomical for Nyasaland to establish its own Film Production Unit and that the local production of films should be undertaken by an outside organisation.

106. We also consider that for the same reason Nyasaland should not for the present set up its own broadcasting service and we agree with the suggestion that two African announcers from Nyasaland should be stationed at Lusaka, Northern Rhodesia, for the broadcasting of scripts of Nyasaland news prepared locally.

107. The "African Weekly" is already in circulation in Nyasaland and we feel that "Nkhani za Nyasaland", enlarged and printed in English and the vernacular, will cater for the masses and we recommend that it be edited by the Public Relations Department and be subsidized by an annual grant not exceeding £1,400.

108. The question of tourist traffic should, in our view, come within the scope of the Public Relations Department, but should continue to be dealt with by the Nyasaland Publicity Committee of which the Public Relations Officer should be Chairman.

109. We suggest that the staff and equipment of the Nyasaland Public Relations Department should be as follows:—

STAFF.

<i>European.</i>	1 Public Relations Officer.
	1 Assistant.
	1 Cameraman.
	1 Maintenance Mechanic for the cinema vans, film strip projectors and wireless receiving sets.
<i>African.</i>	2 Typists.
	1 Accounts Clerk.
	2 Despatching Clerks.
	1 Translator.
	2 Broadcast Announcers.
	3 Operator Mechanics
	3 Driver Mechanics } one for each cinema van.

BUILDINGS AND EQUIPMENT.

The Department will require a suitable roomy building for its various activities and we suggest that a new building be constructed for the purpose.

We understand that one cinema van, 15 film strip projectors and 20 portable wireless receiving sets are being supplied by the Ministry of Information. We recommend that an additional two cinema vans, 15 film strip projectors and 50 wireless receiving sets be obtained in order that the more important schools and social halls can be served.

110. Estimates of the cost of this organisation are given in Appendix X. Because this organisation is, in our opinion, an essential part of the various development plans, we consider that it is a suitable subject for assistance from the Colonial Development and Welfare Act.

VII. Social Welfare Halls.

111. The Public Relations organisation, which we have recommended in the preceding Chapter, will function mainly through the medium of mobile cinema vans, film strip projectors, wireless broadcasts and printed matter, and it follows that a suitable form of building for these purposes will be required at as many centres as possible. There is also a growing demand amongst the African population for the provision of reading rooms, libraries and other social amenities in the districts and we recommend that suitable halls to serve both these purposes should be provided as soon as possible.

112. We suggest that 100 halls be established over a period of ten years at the more important centres throughout the Protectorate. We estimate the cost of a suitable building to be approximately £1,000 and we have included a sum of £100,000 for this purpose in the financial summary in Appendix XIII. More halls will doubtless be required at smaller centres and we feel that these might be provided on a more modest scale and be financed from the Native Development and Welfare Fund.

113. Once these halls have been erected and equipped every effort should be made, in our opinion, to run them as a voluntary effort and this might be done by local Committees under the general supervision, as regards the provision of suitable reading material, of the Provincial Education Officer working in collaboration with the Mass Education Officer and the District Commissioners.

114. In regard to social welfare work generally, we understand that the Mass Education Officer and his woman assistant will, in fact, function as Social Welfare Officers with their headquarters at the Jeanes Training Centre and in that case we see no need at present for the appointment of special officers for this work. We note that there is provision in the 1945 Estimates of the Education Department for a Mass Education Officer and an Assistant and we urge that these appointments be filled as soon as possible.

VIII. African Urban Housing.

115. We have considered a report by the Central Town Planning Advisory Committee in which proposals have been put forward for the housing of Africans in the townships of Blantyre, Limbe, Zomba and Lilongwe. The report suggests that some 4,000 houses be erected at a cost of £150 each and that the carrying out of the scheme and the subsequent management of the houses should be undertaken by Government. We feel that the scheme is too elaborate and that a

suitable type of house could be provided at a far smaller cost. We consider also that the question of urban housing is essentially a matter for the municipal authorities concerned by whom any such scheme should be planned and carried out with financial assistance, if necessary, from Government. In view of the setting up of a Standing Committee under the Central African Council to consider the question of suitable types of housing for Africans, we recommend that further consideration of this matter should await the report of that Committee. In the meantime, however, we suggest that a token figure of £150,000 should be provided to be spent on municipal housing in the territory and this sum has been included in the Financial Summary in Appendix XIII.

IX. Government Provincial Rebuilding Programme.

116. We have noted with concern the primitive and dilapidated state of Government buildings, both offices and residential quarters, in many of the Provincial and District Headquarters throughout the Protectorate and we feel that the present unfavourable conditions under which officers are working and living, particularly in the less healthy outstations, must impair the general efficiency of the service. We, therefore, recommend that a progressive rebuilding programme be carried out over a period of ten years and a list of the works which we consider should be undertaken is shown in Appendix XI. We have suggested an order of priority by placing the various items in categories A, B and C, each representing a period of three to four years.

117. We consider that all new houses constructed, particularly at the more remote stations which are cut off from road communication for most of the rainy season, should be fitted with such amenities as water borne sanitation, modern baths, refrigerators and stoves—amenities which in other countries are regarded as necessities, but which have hitherto in Nyasaland been regarded more as luxuries or semi-luxuries.

118. We consider that this programme of work, which is one of ordinary maintenance and improvement of Government buildings, is not a suitable subject for an application for a grant from the Colonial Development and Welfare Act and that the cost should be met from Protectorate funds.

X. Surveys.

119. No comprehensive survey of Nyasaland has ever been made and the absence of proper survey maps will, in our opinion, be a serious handicap to the planning in detail and carrying out of many of the development schemes recommended in this report.

120. We understand that it is proposed to set up a central organisation for geodetic and topographical survey in the Colonial Empire, but we assume that it would be some considerable time before such a survey of Nyasaland could be completed and maps produced, even if the work were to be started at an early date. We therefore recommend that an aerial survey be made of the whole of Nyasaland, to be followed later by a geodetic and topographical survey. In view of the immense value of an aerial survey in dealing with the many practical problems of development, we recommend that early arrangements be made for it to be carried out. We are unaware of the probable present day cost of such a survey, but we have included a token sum of £100,000 in the financial summary in Appendix XIII.

XI. Re-absorption of Discharged Soldiers.

121. In our Interim Report No. 7 we described the arrangements which had been made or were proposed for the re-absorption of returning soldiers.

122. As regards Europeans, a Committee has now been set up for the purpose of considering applications for financial assistance in undergoing vocational training.

123. In the case of Africans, we realise that the successful execution of many of the schemes outlined in this report depends on the presence in the Protectorate of an adequate male African population, and that the constant southward stream of emigration of adult males has constituted for many years one of the main problems in the way of the development of Nyasaland. It is hoped that the expenditure of some £7,000,000 contemplated in the plans we have submitted, as well as the execution of the plans themselves, will do much to improve conditions in the Protectorate and thus reduce the outward flow of men. In the 30,000 returning soldiers this country will have a body of men with a widened outlook and improved physique and intelligence who, if they remain in the country, can be made into useful agents in commending our plans to the Africans in the villages and in supplying internal stimulus to reinforce the external efforts of the Europeans responsible for carrying out those plans. We consider, therefore, that every effort should be made to retain as many of these men in the Protectorate as possible. A certain number of them who have received technical training in the army will be absorbed in suitable occupations in the Protectorate, as is contemplated in the case of medical orderlies in the scheme for Public Health. In the case of those with no such training, we welcome the circulation of the pamphlets now in preparation explaining the possibilities of making a living by Agriculture, and we suggest that these possibilities, together with the country's need of their services, should be fully explained to them at the Demobilisation Centre by the Civil Dispersal Officer. Yet in spite of these two alternatives open to them, it is likely that some at least of the returning soldiers will wish to seek employment in the South, and in this loss of valuable manpower we can only regretfully acquiesce, in view of our inability to employ them in the country, and do all that is possible to ensure that they go on contract under a system of compulsory family remittances and deferred pay.

124. We understand that demobilisation in Nyasaland will be carried out at the military camp at Ntondwe and that an Administrative Officer has been appointed by Government to act as Civil Demobilisation Officer and to open a Labour Registry Office in that camp. Pending the construction of permanent buildings for Labour Registry Offices at District Headquarters, temporary arrangements have been made to establish and staff such offices on a modest scale but adequate to assist the ex-soldier in seeking employment.

125. We are informed that an organisation has been set up in Kenya for giving further training on demobilisation to those who have been employed in the army in a semi-skilled capacity and that these facilities are available for Nyasaland Africans. The Government of Northern Rhodesia has been asked to set aside a certain number of vacancies for Nyasaland applicants in certain training establishments which are being established there.

126. An After-Care Committee has been set up in each district consisting of the District Commissioner as Chairman, the Chiefs and certain other officials and unofficials for the purpose of giving all possible assistance to returning soldiers.

127. In regard to the rehabilitation of disabled African ex-soldiers, we understand that the following arrangements have been made by Government:—

(a) The military authorities have agreed to retain in army institutions in Kenya men who require treatment and rehabilitation training for a period of eight months from the time they sustained injury or developed a disability. Further treatment and training for those who require it and are ready to undergo it will be afforded by the Civil Rehabilitation Centre in Kenya. Artificial limb fitting will also be carried out in Kenya.

(b) Negotiations are proceeding with the Government of Northern Rhodesia regarding a proposal to establish a joint Rehabilitation Centre for the Central African territories.

(c) Arrangements have been concluded for the accommodation and training of blinded ex-soldiers at Magwero near Fort Jameson in Northern Rhodesia and for the accommodation there of their wives and children.

XII. Finance and Conclusion.

128. A financial summary of the schemes recommended in this report is given in Appendix XIII from which it will be seen that the total capital and recurrent cost of carrying out these schemes over a period of ten years is estimated at £7,511,847.

129. While this figure may appear to be high for such a small country as Nyasaland, it is the case that development has been severely handicapped in the past through lack of funds. The territory is fertile and densely populated, judged by African standards, but it has no secondary industries or mineral resources of any consequence which might provide an alternative to agriculture. It will be appreciated, therefore, that the outcome of any plans for the improvement of social conditions within the country is dependent in the long run on external factors. If the country is able to dispose of its exports on the basis of a steady and reasonable return to the producer, it should be able ultimately to bear the recurrent expenditure envisaged in these post-war development schemes. If, however, external conditions are or become unfavourable, it will be necessary either to call on the Imperial Exchequer for assistance, if the schemes are to bear fruit, or to forego them. It is clear, however, that for some years to come Nyasaland will be unable to meet the cost of these schemes from her own resources. We trust, therefore, that grants to meet this increased annual expenditure will be available under the Colonial Development and Welfare Act both during the ten year period of the schemes recommended in this report and afterwards, if necessary.

130. We suggest, however, that the Protectorate's surplus balances which have been loaned to His Majesty's Government during the war should be utilised for some of the schemes, and in Appendix XIII we suggest the manner in which this might be done. These suggestions are that £814,357 recurrent expenditure and £215,923 capital (including special) expenditure totalling £1,030,280 should be met from the Protectorate's surplus balances and that £2,963,366 recurrent and £3,518,201 capital expenditure totalling £6,481,567 should be met from grants under the Colonial Development and Welfare Act.

131. Appendix XII shows the extent to which the Native Development and Welfare Fund has been used up to the present for financing minor development schemes. We understand that the unallocated balance in this fund is now approximately £178,385 and we recommend that these resources should be preserved for the financing of smaller schemes as and when they arise and that they should not be used to contribute towards the schemes covered by this report.

132. We wish to express our thanks to the Heads of Departments concerned for their assistance in preparing the schemes which we have embodied in this report.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

D. W. SAUNDERS-JONES (*Chairman*)

G. H. ADAMS

W. TAIT BOWIE

M. P. BARROW

H. G. DUNCAN

J. A. LEE

+ FRANK NYASALAND

G. G. S. J. HADLOW

J. MARSHALL

(NOTE—Mr. A. F. Barron was away from the Protectorate during the preparation of this Report).

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

1st October, 1945.

APPENDIX I.

EDUCATION.

A. RECURRENT EXPENDITURE.

	Cost of 1st year.	Cost of 1st five years.	Cost of 2nd five years.	TOTAL
	£	£	£	£
1 Administrative Staff (European) ...	8,570 ...	44,234 ...	48,800 ...	93,034
2 Including Jeanes Training Centre (Native) ...	849 ...	6,009 ...	8,750 ...	14,759
3 Passages ...	1,341 ...	3,595 ...	4,350 ...	7,945
4 Transport and Travelling ...	675 ...	4,315 ...	5,350 ...	9,665
5 Grants-in-aid European Education ...	6,320 ...	32,480 ...	34,200 ...	66,680
6 " African " ...	75,029 ...	427,617 ...	600,000 ...	1,027,617
7 " Indian " ...	1,110 ...	7,390 ...	12,750 ...	20,140
8 " Secondary African Education ...	3,526 ...	22,341 ...	40,000 ...	62,341
9 " Eur-African " ...	3,300 ...	18,300 ...	25,500 ...	43,800
10 Uniforms, Incidentals and Stationery ...	66 ...	457 ...	1,000 ...	1,457
11 Bursaries ...	2,920 ...	15,100 ...	20,850 ...	35,950
12 Jeanes Training Centre—Sundry ...	829 ...	4,483 ...	5,125 ...	9,558
13 Mass Education—Material and Reading Matter ...	2,000 ...	10,000 ...	10,000 ...	20,000
14 Zomba European School ...	593 ...	3,061 ...	3,250 ...	6,311
15 Evening Classes ...	120 ...	720 ...	1,000 ...	1,720
16 University Scholarships ...	900 ...	10,500 ...	25,500 ...	36,000
17 Polytechnic (Recurrent) ...	— ...	44,474 ...	127,264 ...	171,738
TOTAL RECURRENT	£108,148 ...	655,026 ...	973,689 ...	1,628,715

B. SPECIAL EXPENDITURE.

1 Capital Grants—Mission African Schools	5,000 ...	25,000 ...	50,000 ...	75,000
2 Motor Caravan—Jeanes Training Centre ...	— ...	1,500 ...	— ...	1,500
3 Blantyre Secondary School—Works etc. ...	— ...	346 ...	— ...	346
TOTAL SPECIAL	£ 5,000 ...	26,846 ...	50,000 ...	76,846

C. CAPITAL EXPENDITURE.

	£	£	£	£
1 Polytechnic ...	— ...	130,815 ...	— ...	130,815
2 Third Secondary School ...	— ...	8,000 ...	— ...	8,000
3 European Boarding Hostel ...	— ...	— ...	3,000 ...	3,000
4 Eur-African School ...	5,000 ...	16,500 ...	— ...	16,500
5 Jeanes School, Improvements and Extensions	4,500 ...	4,500 ...	— ...	4,500
TOTAL CAPITAL	£ 9,500 ...	159,815 ...	3,000 ...	162,815

D. SUMMARY:

RECURRENT	108,148 ...	655,026 ...	973,689 ...	1,628,715
SPECIAL	5,000 ...	26,846 ...	50,000 ...	76,846
CAPITAL	9,500 ...	159,815 ...	3,000 ...	162,815
	£122,648 ...	841,687 ...	1,026,689 ...	1,868,376

E. ESTIMATED ASSISTANCE REQUIRED.

50% of Recurrent and Special Expenditure				
Excluding Item 1 of B.	54,074 ...	328,437 ...	486,843 ...	815,280
100% of Capital Expenditure	9,500 ...	159,815 ...	3,000 ...	162,815
TOTAL ESTIMATED ASSISTANCE	£ 63,574 ...	488,252 ...	489,843 ...	978,095

APPENDIX II.

HEALTH.

CAPITAL EXPENDITURE.

BUILDINGS.

Item.	Cost of 1st year £	Cost of 1st five years £	Cost of 2nd five years £	TOTAL £
1. Group Hospital, Medical School, Medical and Entomological Laboratories, Blantyre	70,000	180,000	...	180,000
2. Leprosy Settlement, Salima	22,700	87,140	...	87,140
3. Leprosy Settlement, Malamulo	17,570	27,935	...	27,935
4. Mental Hospital	14,000	25,000	...	25,000
5. Four new District Hospitals with Maternity and Child Welfare Centres	88,410	36,420	...	36,420
6. Staff Quarters extensions to existing hospitals and six M. and C.W. Centres	—	91,540	2,000	98,540
7. Rebuilding existing hospital at Fort Johnston	5,000	10,000	...	10,000
8. Training schools and hostels at three Provincial Headquarters	4,000	15,000	...	15,000
9. Two hostels for pupil midwives	1,800	4,000	...	4,000
10. Rebuilding 20 existing dispensaries	450	9,000	...	9,000
11. Improvements to existing hospitals	1,784	2,250	...	2,250
12. Rest houses for ambulant cases	3,290	8,920	...	8,920
13. Rural Dispensaries (35)	...	16,450	...	16,450
14. Expanding 107 dispensaries into Health Units, building 88 complete Health Units and 242 Satellite dispensaries	19,090	95,450	95,450	190,900
	195,094	509,105	97,450	606,555

EQUIPMENT.

15. Equipment for Group Hospital etc.	...	30,000	...	30,000
16. Leprosy Settlements	2,620	8,920	...	8,920
17. Mental Hospital	...	6,500	...	6,500
18. four new District Hospitals	...	4,550	...	4,550
19. existing hospitals and extensions to existing hospitals	6,350	9,150	...	9,150
20. 35 new Rural Dispensaries	280	1,400	...	1,400
21. Motor vehicles—Ambulances and Lorries	2,150	10,900	10,150	21,050
22. X-ray and Electric Light plant at 8 hospitals	1,800	7,200	2,500	9,700
23. Equipment for training schools and hostels	500	1,500	...	1,500
24. " Health Units and Satellite Dispensaries	3,900	16,500	16,500	33,000
25. Sanitary Equipment for Rural Areas	500	6,000	7,500	13,500
	17,500	97,620	36,650	184,270
	212,594	606,725	194,100	740,825

TOTAL CAPITAL EXPENDITURE

HEALTH (Contd.)

RECURRENT EXPENDITURE.

Item.	RECURRENT EXPENDITURE.		Cost of 1st	Cost of 1st	Cost of 2nd	TOTAL.
	£	...	year.	five years.	five years.	£
1. European Staff	4,832	...	130,588	266,702	397,290	
2. Asiatic Staff	...	...	1,248	2,892	4,140	
3. African Staff	1,958	...	51,926	143,810	195,736	
4. Transport and Travelling	200	...	6,790	13,800	20,590	
5. Maintenance of Ambulances and Lorries	100	...	9,700	20,000	29,700	
6. " X-ray and Electric Light plants	...	...	2,700	6,000	8,700	
7. Passages	1,000	...	18,871	37,346	56,217	
8. Drugs, Instruments and Stores	1,647	...	35,725	78,780	114,505	
9. Maintenance of patients in hospital	...	...	7,210	11,800	22,010	
10. Equipment and maintenance of hospitals and dispensaries	346	...	11,800	30,335	42,135	
11. Household equipment for Nursing Staff	450	...	3,160	2,350	5,510	
12. Sanitary Measures and Upkeep of Sanitary Equipment	200	...	4,400	7,500	11,900	
13. Anti-malarial works	...	...	2,500	6,900	9,400	
14. Propaganda	50	...	700	1,000	1,700	
15. Uniforms	130	...	3,625	9,000	12,625	
16. Grants to Missions for training midwives	240	...	1,200	1,200	2,400	
17. Grants to Missions for drugs and dressings	1,000	...	5,000	2,500	7,500	
			297,113	644,915	942,058	

LEPROSY SETTLEMENTS.

LEPROSY SETTLEMENTS.									
18.	Upkeep and Staff, Malamulo and Salima	...	...	...	...	16,782	...	30,975	47,757
		...	...	...	...	17,765	...	31,333	49,098
19.	Mental Hospital:								
	Upkeep	...	...	...	...	7,526	...	12,500	20,026
	African Staff	...	...	...	...	8,115	...	7,625	10,740
						342,331	...	727,348	1,069,679
	TOTAL RECURRENT EXPENDITURE	...	...	...	...	12,153	...		

TOTAL RECURRENT EXPENDITURE

SPECIAL INVESTIGATION. TUBERCULOSIS SURVEY.

Personal Emoluments	1,823	1,823	1,823
Other Charges	1,977	1,977	1,977
	<u>3,800</u>	<u>3,800</u>	<u>3,800</u>
CAPITAL			
RECURRENT	212,594	606,725	740,825
SPECIAL	12,153	842,331	1,069,679
	<u>3,800</u>	<u>3,800</u>	<u>3,800</u>
TOTAL	<u>228,547</u>	<u>952,856</u>	<u>1,814,304</u>

SUMMARY.

CAPITAL	...	212,594	...	606,725	...	134,100	...	140,823
RECURRENT	...	12,153	...	842,331	...	727,848	...	1,069,679
SPECIAL	...	3,800	...	3,800	...	—	...	3,800
TOTAL	...	228,547	...	952,856	...	861,448	...	1,814,304

APPENDIX III.

WATER SUPPLIES.

CAPITAL EXPENDITURE.

	Cost of 1st year. £	Cost of 1st five years. £	Cost of 2nd five years. £	To
HEADQUARTERS:				
2 Houses, Grade II for W. S. Geologists (1 at Mzimba, 1 at Lilongwe) ...	3,200	3,200	—	8
Additional store, laboratory and museum accommodation, renovating of offices, additional fittings and furnishing, etc.	500	500	50	
Renovation and replacement of Surveying and Drawing Instruments	80	80	40	
Camp Equipment and replacement: 2 sets	100	100	60	
Total Headquarters	£3,880	3,880	150	1
FIELD UNITS:				
<i>General:</i>				
Motor lorry, 4-ton, spares and freight	850	850	650	1
Camp equipment and replacement: 2 sets	100	100	60	
Geophysical apparatus and instruments	750	750	300	1
Total Field Units, General	1,700	1,700	1,010	2
DRILLING:				
4 Drilling Machines and Equipment	10,850	10,850	—	10
4 2-ton motor lorries, spares and replacements	2,650	2,650	2,000	4
Camp equipments and replacements: 4 sets	200	200	120	
Total Drilling Units	13,700	13,700	2,120	15
WELL SINKING, ETC.				
Concreting moulds: 3 new sets and 6 replacements	1,550	1,550	2,300	3
Dam scrapers etc. for agricultural Water Supplies, 6 sets and replacements	1,200	1,200	800	2
Six earth augers	100	100	—	
Six electrical explodes and accessories	180	180	—	
Six camp equipments and replacements	300	300	180	
Six 2-ton lorries, spares and replacements	4,000	4,000	3,000	
Six light ($\frac{1}{2}$ — $\frac{3}{4}$ ton) vans, spares and replacements	2,000	2,000	1,500	
Total Well Sinking etc. Units	9,330	9,330	7,780	17
„ Drilling Units	13,700	13,700	2,120	15
„ Field Units, General	1,700	1,700	1,010	3
„ Headquarters	3,880	3,880	150	
TOTAL	£28,610	28,610	11,060	33

RECURRENT EXPENDITURE.

	£	£	£	
PERSONAL EMOLUMENTS:				
Senior Geologist, £880 × £40—£1,000	880	4,760	5,000	1
2 Geologists £500 × 20—£600 × 30—£810	1,000	5,400	6,600	1
Senior Driller £500 × 20—£600	500	2,700	3,000	
3 Drillers, £480 × 20—£540	1,440	7,740	8,100	1
6 W. S. Foremen £372 × 18—£426	2,232	12,132	12,780	2
AFRICAN STAFF:				
Clerk, Grade I, £30 × 4—£75	30	190	290	
Driver, Grade I, £30 × 4—£75	30	190	290	
10 Drivers, Grade II, £30 × 3—£45	300	1,800	2,250	
African Technical Staff	800	4,000	1,000	
Total Personal Emoluments	7,212	38,912	42,310	8
OTHER CHARGES:				
Labour	2,100	10,500	10,500	2
Passages	557	2,785	2,785	
Transport and Travelling	900	4,500	4,500	
Upkeep and Running of Motor Vehicles	1,779	8,895	8,895	1
Transport of Goods	348	1,710	1,710	
Materials, Tools and Equipment	4,212	21,060	21,060	1
Library, Drawing Office, Laboratory, Museum, etc.	114	570	570	
Maintenance of Buildings	12	60	60	
Agencies	38	190	190	
Uniforms	20	100	100	
Agricultural Water Supplies (dams etc.)	1,260	6,300	6,300	1
Total Other Charges	11,340	56,700	56,700	1
Total Personal Emoluments	7,212	38,912	42,310	8
TOTAL RECURRENT EXPENDITURE	18,552	95,612	99,010	19
TOTAL CAPITAL EXPENDITURE	28,610	28,610	11,060	3
TOTAL RECURRENT EXPENDITURE	18,552	95,612	99,010	19
TOTAL	47,162	124,222	110,070	22

APPENDIX IV.

AGRICULTURE.

1. LAND USAGE SCHEME.

RECURRENT EXPENDITURE.

Personal Emoluments.

	<i>Salary scale.</i>	Cost of 1st year	Cost of 1st five years	Cost of 2nd five years	Cost of 3rd five years	TOTAL
		£	£	£	£	£
1 Soil Conservation Officer	£1,200	1,200	6,000	6,000	6,000	18,000
1 Asst. Soil Conservation Officer	£1,000	1,000	5,000	5,000	5,000	15,000
3 Agricultural Officers	£400 (2 years) £450 x 25 £600					
	£550 x 30 £840	2,520	12,600	12,600	12,600	37,800
2 Surveyors	(Salary scale as for A.O.S.)					
12 Agricultural Assistants	£300 x 18 £540	1,680	8,400	8,400	8,400	25,200
1 Head Mechanic	£480 x 20 £960	3,600	20,160	25,560	28,800	74,520
1 Junior Mechanic	£300 x 18 £540	480	2,600	2,980	3,000	8,580
1 European Clerk	£300 x 18 £540	300	1,680	2,140	2,400	6,220
African Staff—various	£300 x 18 £540	300	1,680	2,140	2,400	6,220
		4,722	27,000	33,000	38,017	98,017

Other Charges.

Transport and Travelling	...	2,470	12,350	12,350	12,350	37,050
Passages	...	...	7,140	7,140	7,142	21,422
Other items	...	4,290	24,722	24,723	24,723	74,168
TOTAL RECURRENT EXPENDITURE	...	22,562	129,332	142,033	150,832	422,197

CAPITAL EXPENDITURE.

Houses and furniture	...	26,220	26,220	...	...	26,220
Equipment	...	24,505	24,505	...	...	24,505
TOTAL CAPITAL EXPENDITURE	...	50,725	50,725	...	...	50,725
TOTAL EXPENDITURE	...	73,287	180,057	142,033	150,832	472,922

AGRICULTURE (Contd.)

2. TOBACCO RESEARCH STATION SCHEME.

RECURRENT EXPENDITURE.

Personal Emoluments.

	Salary scale.	Cost of 1st year £	Cost of 1st five years £	Cost of 2nd five years £	TOTAL £
1 Senior Agricultural Officer ...	£880 x 40—£1,000 ...	880	4,760	5,000	9,760
1 Chemist ...	£600 x 30—£720 x 30—£840				
1 Plant Breeder ...	£600 x 30—£720 x 30—£840 x 40—£920	2,400	13,000	16,040	29,040
1 Plant Physiologist ...	do				
1 Plant Pathologist ...	do				
1 Farm Manager ...		418	2,090	2,090	4,180
African Staff ...		982	4,800	5,670	10,470

Other Charges.

Transport and Travelling ...	500	2,500	2,500	5,000
Passages ...	1,200	3,000	3,000	6,000
Other items ...	600	3,000	3,000	6,000
TOTAL RECURRENT EXPENDITURE	6,980	33,150	37,300	70,450

CAPITAL EXPENDITURE.

Buildings ...	15,210	15,210		15,210
Equipment ...	4,800	4,800		4,800
Compensation to occupiers of land ...	500	500		500
Visit of S.A.O. to U.S.A. ...	500	500		500
TOTAL CAPITAL EXPENDITURE	21,010	21,010		21,010
TOTAL EXPENDITURE	27,990	54,160	37,300	91,460

AGRICULTURE (Contd.)

3. TEA EXPERIMENTAL STATION, MLANJE.

RECURRENT EXPENDITURE.	Cost of 1st year.	Cost of 1st five years.	Cost of 2nd five years.	Total.
<i>Personal Emoluments.</i>	£	£	£	£
African Staff and Labour ...	100	1,500	3,000	4,500
<i>Other Charges.</i>				
Tools and Equipment ...	200	400	500	900
Total Recurrent Expenditure ...	300	1,900	3,500	5,400
CAPITAL EXPENDITURE.				
Purchase of Land ...	2,000	2,000	—	2,000
Buildings and Labour Lines ...	2,500	2,500	—	2,500
Tea Factory and Equipment ...	20,000	20,000	—	20,000
Visit of A. O. to Ceylon and India	500	500	—	500
Total Capital Expenditure ...	25,000	25,000	—	25,000
Total Expenditure ...	£25,300	26,900	3,500	30,400

4. TUNG DEVELOPMENT COMPANY.

CAPITAL EXPENDITURE ...	£25,000	£125,000	—	£125,000
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5. TUNG EXPERIMENT STATION.

RECURRENT EXPENDITURE.

<i>Personal Emoluments.</i>				
<i>Salary scale.</i>	£	£	£	£
Analyst > £100 to £600 ...	—	1,260	2,940	4,200
<i>Other Charges.</i>				
Passages ...	—	200	400	600
Transport and Travelling ...	—	350	550	900
Other items ...	—	100	100	200
Total Recurrent Expenditure ...	—	1,910	3,990	5,900

CAPITAL EXPENDITURE.

House and furniture ...	1,400	1,400	—	1,400
Laboratory ...	1,000	1,000	—	1,000
Equipment ...	200	200	—	200
Total Capital Expenditure ...	2,600	2,600	—	2,600
Total Expenditure ...	£2,600	4,510	3,990	8,500

6. VIPYA HIGHLANDS FARM.

RECURRENT EXPENDITURE.

<i>Personal Emoluments.</i>	£	£	£	£
1 Agricultural Assistant ...	380	2,100	—	2,100
African Staff ...	160	820	—	820
<i>Other Charges.</i>				
Transport and Travelling ...	100	500	—	500
Passages ...	—	120	—	120
Other items ...	200	500	—	500
Total Recurrent Expenditure ...	840	4,040	—	4,040

CAPITAL EXPENDITURE.

Buildings ...	2,100	2,100	—	2,100
Livestock ...	500	500	—	500
Equipment ...	1,300	1,300	—	1,300
Total Capital Expenditure ...	3,900	3,900	—	3,900
Total Expenditure ...	£4,740	7,940	—	7,940

AGRICULTURE (Contd.)

7. AGRICULTURAL DEVELOPMENT PLAN.

RECURRENT EXPENDITURE.

Personal Emoluments.

1 Senior Agricultural Officer	£880 by £40 to £1,000	...	...	...	...	...	...	...	...
5 Agricultural Officers	£400 (2 years) £450 by £25 to £600, £660 by £80 to £840	...	...	...	...	...	...	...	...
1 Plant Breeder	£600 by £30 to £720 by £30 to £840 by £40 to £920	...	...	...	...	...	...	...	...
1 Senior Agricultural Assistant	£480 by £20 to £540	...	...	...	...	...	...	...	...
4 Agricultural Assistants	£300 by 18 to £480	...	...	...	...	...	...	...	...
500 African Instructors (progressive increase 50 per annum for 10 year period £19 by £3 to £27		...	...	...	...	...	...	...	...

Other Charges.

Transport and Travelling	1,500	...	...	...	...	...	...	...	...
Passages	2,000	...	...	...	...	...	...	...	...
Other items	2,000	...	...	...	...	...	...	...	...

Total Recurrent Expenditure

CAPITAL EXPENDITURE.

Buildings	15,000	...	...	...	...	...	...	...	...
Furniture	7,500	...	...	...	...	...	...	...	...

Total Capital Expenditure

Total Expenditure

8. SUMMARY.

TOTAL RECURRENT EXPENDITURE

TOTAL CAPITAL EXPENDITURE

TOTAL

	Cost of 1st year.	Cost of 1st five years.	Cost of 2nd five years.	Cost of 3rd five years.	TOTAL.
	£	£	£	£	£
...	880	4,760	5,000	...	9,760
...	800	4,450	5,820	...	10,270
...	600	3,300	4,060	...	7,360
...	480	2,580	2,700	...	5,280
...	1,200	6,720	8,250	...	14,970
...	950	16,950	50,250	...	67,200
...	...	...	...	...	...
...	1,500	8,000	9,500	...	17,500
...	2,000	4,000	4,000	...	8,000
...	2,000	10,000	10,000	...	20,000
...	...	...	...	...	...
...	£10,410	60,760	99,580	...	160,340
...	...	...	...	...	...
...	15,000	15,000	...	...	15,000
...	7,500	7,500	...	...	7,500
...	...	...	...	...	...
...	22,500	22,500	...	...	22,500
...	...	...	...	...	...
...	32,910	83,260	99,580	...	182,840
...	...	...	...	...	...
...	11,092	231,092	286,403	150,832	668,327
...	...	...	...	...	...
...	150,735	250,735	...	...	250,062
...	...	...	...	...	...
...	£191,927	481,827	286,403	150,832	919,062
...	...	...	...	...	...

STOCK IMPROVEMENT.

ESTABLISHMENT OF NINE CENTRES.

CAPITAL EXPENDITURE.

				First Year.
				£
BUILDINGS AND EQUIPMENT.				
1	Office	...	...	100
8	Dwelling Houses for Livestock Officers at £750	...	...	6,000
1	House for clerk	...	...	75
8	Houses for African Livestock Assistants at £35	...	...	280
38	African staff houses at £25	...	...	950
54	Pise de terre houses for labour at £10	...	...	540
9	Kitchens at £20	...	...	180
8	Dairies at £60	...	...	580
1	Dairy at £100	...	...	225
9	Separating Rooms at £25	...	...	225
16	Cattle byres at £55	...	...	1,180
6	" " £50	...	...	225
9	Kraals for Oxen at £25	...	...	875
35	Bull Pens at £25	...	...	950
	Pig Pens	...	...	270
9	Milk Sheds at £30	...	...	50
	Sheep and Goat Pens	...	...	540
36	Poultry Houses at £15	...	...	560
8	Food, tool and equipment stores	...	...	1,800
	Instruments and equipment	...	...	270
9	Farm Carts at £30	...	...	540
9	Maize Tanks at £60	...	...	280
1	Weigh bridge	...	...	1,800
9	Dipping tanks at £200	...	...	250
5	Dams at £50	...	...	18,470
LIVESTOCK.				
<i>Locally selected livestock.</i>				
630	Heifers at £4	...	...	2,520
60	Heifers at £6	...	...	360
28	Bulls at £6	...	...	168
3	Bulls at £8	...	...	24
32	Oxen at £5	...	...	160
	Goats, Rams and Ewes	...	...	800
	Miscellaneous livestock	...	...	355
<i>Imported livestock</i>				
90	Heifers at £7	...	...	630
	Bulls	...	...	600
	Rams and ewes	...	...	100
	Boars	...	...	450
	Sows	...	...	2,160
	Ducks and Turkeys	...	...	450
Total of Livestock				8,777
LAND AND FENCING.				
	Cost of purchase of land for Centre in Southern Province	...	...	1,521
	Compensation to dispossessed garden owners	...	...	80
	Fencing	...	...	1,800
Total cost of Land and Fencing				3,401
TOTAL CAPITAL EXPENDITURE				<u>£30,648</u>

STOCK IMPROVEMENT. (Contd.)

RECURRENT EXPENDITURE.

	Cost of 1st year.	Cost of first five years.	Cost of 2nd five years.	TOTAL
PERSONAL EMOLUMENTS				
European Livestock Officers (9) ...	4,500	24,750	27,000	51,750
Trained African Staff ...	851	5,015	6,246	11,261
Labour ...	1,653	8,265	8,265	16,530
TOTAL PERSONAL EMOLUMENTS ...	7,004	38,030	41,511	79,541
OTHER CHARGES.				
Food for Livestock ...	720	3,600	3,600	7,200
Stationery and Incidentals ...	185	675	675	1,350
Passages ...	1,544	4,167	6,750	10,917
Buildings Maintenance and Repairs	900	4,500	4,500	9,000
TOTAL OTHER CHARGES ...	3,299	12,942	15,525	28,467
TOTAL RECURRENT EXPENDITURE	10,303	50,972	57,036	108,008
TOTAL CAPITAL EXPENDITURE	30,648	30,648		30,648
TOTAL EXPENDITURE. ...	40,951	81,620	57,036	188,656

APPENDIX VI.

FORESTRY.

FIFTEEN YEAR PLAN OF DEVELOPMENT.

I. PRODUCTION OF SAW TIMBER FOR THE NEEDS OF THE AFRICAN RURAL POPULATION.

500 acres a year for 3 years	1,500 acres
800 " " " " 3 "	2,400 "
1,200 " " " " 3 "	3,600 "
1,500 " " " " 6 "	9,000 "
Total 15 "	16,500 acres at £5 an acre
	£82,500

Tools and Equipment ...	5,500	£88,000
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II. EXTRA EUROPEAN STAFF.

(a) Five extra European Foresters

(i) Two commencing in the 1st year (for 15 years) @ 6,822 = 13,644	£
(ii) Two " " " 4th " (for 12 years) @ 5,382 = 10,764	
(iii) One " " " 7th " (for 9 years) @ 3,942 = 3,942	

28,350

(b) Transport and Travelling of Foresters

6,300

(c) Passages of Foresters

7,875

42,525

(d) Two European Clerks (for 15 years) at £6,210

£12,420

(e) Passages of Clerks

3,850

16,270

III. EXTRA AFRICAN FIELD STAFF.

(a) Forest Rangers:—

16 for 15 years	{ £384 10 0 each	£5,352
24 " 14 "	{ 307 10 0 "	7,380
24 " 13 "	{ 280 10 0 "	6,732
24 " 12 "	{ 253 10 0 "	6,084
24 " 11 "	{ 226 10 0 "	5,436

Total 112 ... **30,984**

(b) Transport and Travelling of Rangers

4,320

(c) Uniforms of Rangers

1,440

36,744

TOTAL RECURRENT EXPENDITURE

£188,539

IV. CAPITAL EXPENDITURE.

(a) Housing 5 European Foresters 2 Clerks

at £800 = £5,600

(b) Housing 112 Forest Rangers at £30

= £3,360

(c) Rents, etc.

875

(d) Offices

3,600

TOTAL CAPITAL EXPENDITURE

£12,935

TOTAL RECURRENT AND CAPITAL EXPENDITURE

£196,474

I. RECURRENT EXPENDITURE.

		First 3 years	Second 3 years	Third 3 years	Fourth 3 years	Fifth 3 years	TOTAL FOR 15 YEARS
		£	£	£	£	£	£
STAFF.							
5	European Foresters ...	2,340	5,004	6,714	7,092	7,200	28,350
2	" Clerks ...	1,908	2,232	2,556	2,844	2,880	12,420
112	Forest Rangers (African)	1,548	4,812	6,960	8,592	9,072	30,984
OTHER CHARGES.							
	Passages ...	2,100	2,100	2,275	2,450	2,800	11,725
	Travelling (European)	600	1,200	1,500	1,500	1,500	6,300
	Travelling (African)	360	936	1,008	1,008	1,008	4,320
	Uniforms (African)	120	312	336	336	336	1,440
	Planting, etc.	7,500	12,000	18,000	22,500	22,500	82,500
	Tools, etc.	500	800	1,200	1,500	1,500	5,500
	Total Recurrent Expenditure	16,976	29,396	40,549	47,822	48,796	183,539

II. CAPITAL EXPENDITURE.

Housing: (1) European Foresters ...	...	1,600	...	...	...	1,600	...	...	...	1,600	...	...	...	...	800	...	...	...	...	...	...	...	...	...	...	...	4,000
(2) " Clerks ...	...	1,600	...	...	...	1,600	...	...	...	—	...	...	...	...	—	...	...	...	...	...	...	...	...	...	...	...	1,600
(3) Forest Rangers (African) ...	...	1,920	...	...	...	1,920	...	...	...	1,440	...	...	...	...	—	...	...	...	...	...	...	...	...	...	...	...	3,360
Tents, etc. ...	...	150	...	...	...	150	...	...	...	150	...	...	...	...	75	...	...	...	...	...	...	...	...	...	...	...	375
Offices ...	...	1,200	...	...	...	1,200	...	...	...	1,200	...	...	...	...	1,200	...	...	...	...	...	...	...	...	...	...	...	3,600
TOTAL CAPITAL EXPENDITURE	...	6,470	...	...	...	6,470	...	...	...	4,390	...	...	...	...	2,075	...	...	...	...	...	...	...	...	...	...	...	12,935
TOTAL RECURRENT AND CAPITAL EXPENDITURE	...	23,446	...	...	...	23,446	...	...	...	33,786	...	...	...	...	42,624	...	...	...	...	47,822	...	...	...	...	...	...	196,474
AVERAGE ANNUAL EXPENDITURE	...	7,815	...	...	...	7,815	...	...	...	11,262	...	...	...	...	14,208	...	...	...	...	15,941	...	...	...	...	...	...	65

III. REVENUE.

Maximum annual revenue from cash sales is estimated at £6,000, making a maximum total of £80,000 over a period of 10 years of which Native Authorities are likely to receive an ever-increasing share in respect of trust lands.

In addition to cash revenue, however, there are always considerable free issues or issues at cost to Government departments, which are expected to continue. The value in 1944 was £16,741.

APPENDIX VII.

ROADS.

I. NEW ROADS.

	Miles.	Estimate. £
1. Monkey Bay to Railway near Sharpe Vale—Tar-Macadam Road from Railway to Principal Lake Port	44	88,000
2. Fort Hill-Karonga	72	15,000
3. Karonga-Kaporo-Songwe River	20	6,200
4. Tekerani Road	8	1,200
5. Ruu-Mloza River on East of Mlanje	15	2,400
6. Mwanza-Thambani	18	3,000
7. Rho Tuchila Triangle	14	1,500
8. Kambalame-Chikwawa-Ngabu-Chiromo	114	12,200
9. Kawinga-Mpiri-Nyambi	30	2,000
10. Kalembo-Shire River-Ngueje	25	2,200
11. Katema-Nankumba	25	1,500
12. Mile 18 Fort Johnston-Namwera Road and Katuli	15	1,000
13. Lunzu-Chilangoma Hill	6	300
14. Chiradzulu-Ndunde-Namitembo	18	3,100
15. Chikwawa-Chepananya	30	2,400
16. Fort Johnston-Fort Maguire	75	20,000
17. Nyika Plateau Road	...	50,000
18. Mlanje Plateau Road	...	25,000
		<u>£237,000</u>

II. IMPROVEMENTS TO EXISTING ROADS.

A. Tar-macadaming.

	Miles.	Estimate. £
1. Blantyre-Chileka Airport	12	22,000
2. Salima-Lilongwe	71	142,000
3. Limbe-Cholo-Luchenza-Mlanje-P.E.A. Border	62	87,000
4. Limbe-Zomba-Palombe Turn Off	40	56,000
Lilongwe-Natenje	14	26,000
Lilongwe-Lombadzi-Mponela	39	71,000
7. Lilongwe-Fort Manning-N. R. Border	79	143,000
8. Ekwendeni-Nkata Bay	84	154,000
		<u>£701,000</u>

B. Improvements to Earth Roads.

1. Limbe-Blantyre-Fundis Cross-Palombe	48	5,000
2. Kasungu-Kota Kota	78	4,000
3. Mzimba-Njakwa-Fort Hill-Tunduma	283	16,000
4. Njakwa-Livingstonia-Florence Bay	52	6,000
5. Fort Johnston-Monkey Bay Road-Kasanka	50	6,000
6. Zomba-Plateau Road	5	6,000
7. Salima-Lake Shore Road	20	1,600
8. Salima-Lipimbe-Kasache	14	3,200
9. Mwanza-Neno-Goche-Biri-wiri	86	3,500
10. Ngabu-Almienda	12	300
11. Main Chiradzulu Road	17	700
12. Port Herald-Ndamera	17	1,700
		<u>£54,000</u>

SUMMARY.

New Roads (Including new tar-macadam road from railway to Monkey Bay)	£237,000
Improvements--Tar-macadam	701,000
do --Earth Roads	54,000
	<u>£992,000</u>
Plant, Rollers, Stone Crushers, Sprayers, Road Plant, etc., etc.	£83,000
	<u>£1,075,000</u>

AIR TRANSPORT.

CAPITAL EXPENDITURE		Cost of 1st year.	Cost of 1st five years.	Cost of 2nd five years.	TOTAL.
		£	£	£	£
INTERNAL AIR SERVICE.					
1. Contribution to capital of Central African Airways					
AERODROMES.					
2. <i>Chileka</i> : Paving of runways and plant	...	75,000	75,000	...	75,000
3. Terminal building	...	100,000	136,000	...	136,000
4. Other buildings and improvements	...	4,000	4,000	...	4,000
5. <i>Zomba</i> : Improvements, Plant and buildings	...	8,000	10,000	...	10,000
6. <i>Lilongwe</i> : Improvements and Plant	...	16,000	22,700	...	22,700
	...	1,300	1,300	...	1,300
LANDING GROUNDS.					
7. Capital Expenditure on new airfields and extensions and improvements to existing airfields	...	3,500	5,500	...	5,500
METEOROLOGY.					
8. European Quarters	...	1,000	1,000	...	1,000
9. African Quarters	...	300	300	...	300
TELECOMMUNICATIONS.					
10. R/T installations at <i>Chileka</i> , <i>Zomba</i> , <i>Lilongwe</i> and <i>Mzimba</i>	...	1,000	1,000	...	1,000
Total Capital Expenditure*	...	210,100	256,800	...	256,800
RECURRENT EXPENDITURE:					
PERSONAL EMOLUMENTS.					
1. Registrar of Aircraft £720 by £30 to £340	...	720	3,900	4,200	8,100
2. Clerk £300 by £18 to £480	...	300	1,680	2,180	3,810
OTHER CHARGES.					
3. Passages	...	...	360	720	1,080
4. Annual contribution to internal air services	...	1,000	5,000	5,000	10,000
5. Annual contribution to Regional service	...	100	500	500	1,000
6. Addition of 20% to annual maintenance of landing grounds	...	200	1,000	1,000	2,000
7. Contribution to joint Meteorological Service	...	1,200	6,000	6,000	12,000
8. Subsidy to Nyasaland Aero Club	...	1,500	7,500	7,500	15,000
Total Recurrent Expenditure	...	5,020	25,940	27,050	52,990
TOTAL CAPITAL EXPENDITURE	...	210,100	256,800	...	256,800
TOTAL RECURRENT EXPENDITURE	...	5,020	25,940	27,050	52,990
TOTAL	...	215,120	282,740	27,050	309,780

APPENDIX IX.

POSTAL, TELEGRAPH & TELEPHONE SERVICES.

	Cost of 1st year. £	Cost of 1st five years. £	Cost of 2nd five years. £	TOTAL. £
(1) CAPITAL EXPENDITURE.				
32 New Buildings at existing Post Offices	1,800	10,000	6,700	16,700
8 Proposed New Post Offices	850	2,600	2,500	5,100
Other Buildings (Stores, Limbe)	500	500	—	500
Housing of Staff	3,000	11,000	10,000	21,000
Furniture and Equipment Post Offices	500	2,500	2,500	5,000
Existing and Proposed	24,000	120,000	—	120,000
Telegraph and Telephone Installations (see details at attached)	1,200	1,200	1,200	2,400
Equipment (3 Vans)				
TOTAL CAPITAL EXPENDITURE	31,850	147,800	22,900	170,700

(2) RECURRENT EXPENDITURE.

PERSONAL EMOLUMENTS.				
European Telegraph Inspectors (2)	1,040	5,720	7,020	—
Postal Surveyor (1)	552	3,086	3,919	—
Asst. Accountant (1)	455	2,567	3,401	—
Senior Postmaster (1)	624	3,880	3,874	—
Postmasters & Asst. Postmasters (2)	966	5,304	6,192	—
African Linemen and Van Drivers (11)	830	1,960	2,825	—
OTHER CHARGES.				
Transport & Travelling	600	3,000	3,000	—
Line Material	500	2,500	2,500	—
TOTAL RECURRENT EXPENDITURE	5,067	27,537	32,731	60,268
TOTAL CAPITAL EXPENDITURE	31,850	147,800	22,900	170,700
TOTAL	36,917	175,337	55,631	280,968

POSTAL, TELEGRAPH AND TELEPHONE SERVICES. (Contd.)

DETAILS OF NEW TELEGRAPH AND TELEPHONE INSTALLATIONS.

SOUTHERN PROVINCE.

		<i>Estimated Cost.</i>
Limbe—Cholo. (21 miles)	With increased traffic on the Mlanje-Cholo-Limbe section a further telephone circuit (2 wires) will be necessary. To be constructed of 200 lbs. copper wire on existing pole route.	£1,000
Zomba—Limbe (39 miles)	The existing Zomba-Limbe trunk lines are congested. With increased traffic a further 2 telephone circuits (4 wires) are required and the present route would have to be strengthened to carry these 200 lb. copper lines.	4,000
Fort Johnston. Monkey Bay (40 miles)	Telephone circuit (2-200 GI wires) utilising one existing wire on existing pole route.	1,000
Limbe-Border Siding. (123 miles)	Two telephone circuits (4 wires) with telegraphs superimposed. 200 lb. copper wire on iron poles. Utilising our Limbe-Luchenza pole route and thence on new iron pole route parallel with the Railway.	16,000
Liwonde (Kasupe)- Fort Johnston (60 miles)	Add second GI wire to existing telegraph circuit to provide telephone circuit with telegraph superimposed.	1,000
Fort Johnston- Namwera.	Replace unsatisfactory aerial crossing by under-river cable.	800

CENTRAL AND NORTHERN PROVINCES.

Zomba-Liwonde-Ncheu- Dedza-Mkhoma-Lilongwe. (185 miles)	Two telephone pairs (4-200 lb. copper) with telegraphs superimposed. On existing iron pole route, Zomba-Fort Johnston turn-off, and thence on iron poles. One telephone circuit for direct working Lilongwe-Zomba and the second for intermediate office working.	31,700
Lilongwe-Dowa-Salima. (80 miles)	Three telephone circuits (6-200 lb. copper wires) with telegraph superimposed to the Lilongwe-Kasungu-Dowa (turn-off) and one telephone circuit from turn-off to Salima via Dowa. The first portion on heavy poles and the second on farmers poles. Four of the wires on the first portion to be used on the Lilongwe-Mzimba route and the remaining two on the Lilongwe-Dowa-Salima route.	18,000

Carried forward £68,000

Estimated Cost.

Brought forward ... £68,000

**Dowa-Kasungu (turn-off)
Mzimba.
(162 miles)**

Two telephone circuits (4-200 lbs. copper wires) with telegraphs superimposed. On farmers poles. ... 15,000

**Mzimba-Ekwendeni-
Njakwa-Livingstonia.
(162 miles)**

One telephone circuit (2-200 lb. copper wires) with telegraphs superimposed. On farmers poles. ... 12,000

**Livingstonia-Karonga.
(62 miles)**

Additional telephone circuit (2-200 lb. copper wires) with telegraphs superimposed. On existing pole route. ... 3,000

**Lilongwe-Fort Manning-
(Fort Jameson).
(74 miles).**

One telephone circuit (2-200 lb. copper wires). On farmers poles. The present pole route runs through the Bua marshes for a considerable distance and is inaccessible for maintenance. It would not be advisable to utilise this route for the telephone line. ... 7,500

**Mzimba-Embangweni-
N. Rhodesia Border
(Lundazi) (40 miles)**

One telephone circuit (2-200 lb. copper wires) on farmers poles. Utilise Kasungu-Mzimba pole route to turn-off to Embangweni. ... 2,500

**Karonga-Fort Hill.
(40 miles)**

Add second GI wire to present earth return circuit. Add iron poles in sections where these were removed by the Germans in 1915. ... 2,000

**Karonga-Northern
Border.
(20 miles)**

Add copper telephone trunk to existing iron pole GI telegraph route. ... 1,200

**Fort Johnston-Salima-
Kota Kota-Chinteché-
Livingstonia.**

The existing route would be maintained in its present condition and utilised as a telegraph outlet to the stations concerned and as an emergency telegraph outlet to T. T. If one section of the line was interrupted communication to the stations could be maintained from either north or south of the point of the interruption. One or two deviations will be necessary at points where the lines runs through marshes and maintenance is difficult. ... 800

EQUIPMENT.

Telephone Repeaters, Limbe and Lilongwe ... 1,000

Teleprinters ... 800

Exchange Buildings at Mzimba and Zomba (2 at £200) ... 400

Quarters for African maintenance officers (8 at £75) ... 600

House for European maintenance officer ... 1,000

Contingencies ... 4,200

TOTAL £120,000

APPENDIX X.

PUBLIC RELATIONS.

CAPITAL EXPENDITURE.

Item.		Cost of 1st year. £	Cost of 1st five years. £	Cost of 2nd five years. £	TOTAL £
1	Building	1,000	1,000	...	1,000
2	70 Wireless Sets @ £40	2,800	2,800	...	2,800
3	5 Cinema Vans @ £1,750	3,500	8,750	...	8,750
4	Cameras and Projectors	500	500	...	500
5	15 strip film projectors @ £20	300	300	...	300
	TOTAL	£8,100	£13,350	...	£13,350

RECURRENT EXPENDITURE.

6	Public Relations Officer	720	3,900	4,560	8,460
7	Asst. Public Relations Officer	600	3,300	3,800	6,900
8	Cameraman	372	2,040	2,382	4,422
9	Mechanic	372	2,040	2,382	4,422
10	Passages	—	360	720	1,080
11	African Staff, 14 @ £40	560	2,800	2,800	5,600
12	Other Charges	1,420	7,100	5,100	12,200
	TOTAL	£4,044	21,540	21,544	£43,084
	TOTAL CAPITAL AND RECURRENT	£12,144	£34,890	£21,544	£56,484

APPENDIX XI.

GOVERNMENT PROVINCIAL REBUILDING PROGRAMME.

SOUTHERN PROVINCE.

BLANTYRE.

A Government Offices	...	...	...	15,000
A High Court				

CHOLO.

A District Offices	...	...	...	5,000
A House for District Commissioner				

MLANJE.

A Water Sanitation throughout Station	...	...	...	1,000
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FORT JOHNSTON.

B District Offices				
C House for District Commissioner	...	...	...	6,000
C House for Asst. District Commissioner				

PORT HERALD.

C Offices	...	...	...	6,000
C Two houses				

CENTRAL PROVINCE.

LILONGWE.

A Provincial and District Offices	...	...	...	10,000
A House for Asst. District Commissioner				

KOTA KOTA.

A District Offices	...	...	...	5,000
A House for Asst. District Commissioner				

DOWA.

A District Offices	...	...	...	3,200
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NCHEU.

B District Offices	...	...	...	5,000
B House for District Commissioner				

NORTHERN PROVINCE.

MZIMBA.

A New Provincial and District Headquarters	...	...	...	76,000
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CHINTECHE.

A District Offices				
A House for District Commissioner	...	...	...	6,000
A House for Asst. District Commissioner				

KABONGA.

A House for District Commissioner	...	...	...	1,800
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TOTAL ... £140,000

Note: The above works have been placed in priority categories A, B and C representing three periods of a ten year programme.

APPENDIX XII.

LIST OF GRANTS MADE FROM THE NATIVE DEVELOPMENT AND WELFARE FUND UP TO THE 30TH SEPTEMBER, 1945.

1. AGRICULTURE.

(a) Demonstration Plots, Seed Production Farms.	...	...	...	£
Purchase of Seed, etc.	...	...	...	1,019
(b) Soil Conservation and Land Usage	...	...	...	5,689
(c) Famine Relief, Grain Stores	...	...	...	1,025
(d) Crop Protection	...	...	...	400
(e) Dams	...	...	...	200

2. MEDICAL.

(a) Health facilities	...	...	...	2,777
(b) Sick Repatriates Hostel	...	...	...	25

Carried forward ... 11,135

					£
		<i>Brought forward</i>	...		11,185
3.	VETERINARY.				
	(a) Stock Improvement	...	...	...	240
	(b) Tanning	...	...	...	256
1.	EDUCATION.				
	(a) Vernacular Literature	...	...	...	1,500
	(b) Social Welfare Hall	...	...	...	1,691
5.	RE-AFFORESTATION	...	...	...	3,000
6.	COMMUNICATIONS.				
	(a) Road	...	...	...	150
	(b) Rest Houses and Shelters	...	...	...	681
7.	GRANTS-IN-AID TO NATIVE TREASURIES	...	...	...	488
	TOTAL	...	...	...	<u>£19,186</u>

APPENDIX XIII.

FINANCIAL SUMMARY OF TEN YEAR PERIOD.

PART I.

	Cost of first year.	Cost of first 5 years.	Cost of second 5 years.	TOTAL COST.
	£	£	£	£
1. EDUCATION (including Polytechnic)				
Capital Expenditure (including Special)	14,500	186,661	53,000	239,661
Recurrent	108,148	655,026	973,689	1,628,715
Total	<u>122,648</u>	<u>841,687</u>	<u>1,026,689</u>	<u>1,868,376</u>
2. HEALTH				
Capital Expenditure (including Special)	216,394	610,525	134,100	744,625
Recurrent	12,153	342,331	727,348	1,069,679
Total	<u>228,547</u>	<u>952,856</u>	<u>861,448</u>	<u>1,814,304</u>
3. WATER SUPPLIES				
Capital Expenditure	28,610	28,610	11,060	39,670
Recurrent	18,552	95,612	99,010	194,622
Total	<u>47,162</u>	<u>124,222</u>	<u>110,070</u>	<u>234,292</u>
4. AGRICULTURE				
Capital Expenditure	150,735	250,735	—	250,735
Recurrent	41,092	231,092	286,403	517,495
Total	<u>191,827</u>	<u>481,827</u>	<u>286,403</u>	<u>768,230</u>
5. STOCK IMPROVEMENT CENTRES				
Capital Expenditure	30,648	30,648	—	30,648
Recurrent	10,303	50,972	57,036	108,008
Total	<u>40,951</u>	<u>81,620</u>	<u>57,036</u>	<u>138,656</u>
6. FORESTRY				
Capital Expenditure	6,470	10,860	2,075	12,935
Recurrent	5,659	36,573	66,289	102,862
Total	<u>12,129</u>	<u>47,433</u>	<u>68,364</u>	<u>115,797</u>
7. STABILISATION OF LAKE LEVEL				
Capital Expenditure	25,000	160,000	—	160,000
8. FLOOD WATER CONTROL LOWER RIVER				
Capital Expenditure	25,000	250,000	—	250,000

9. ROAD PROGRAMME							
Capital Expenditure ...	...	107,500	...	537,500	...	537,500	1,075,000
10. AIR TRANSPORT							
Capital Expenditure ...	...	210,100	...	256,800	...	—	256,800
Recurrent ..	...	5,020	...	25,940	...	27,050	52,990
Total	...	215,120	...	282,740	...	27,050	309,790
11. POSTAL, TELEGRAPH AND TELEPHONE SERVICES							
Capital Expenditure ...	...	31,850	...	147,800	...	22,900	170,700
Recurrent ..	...	5,067	...	27,537	...	32,731	60,268
Total	...	36,917	...	175,337	...	55,631	230,968
12. PUBLIC RELATIONS							
Capital Expenditure ...	...	8,100	...	13,350	...	—	13,350
Recurrent ..	...	4,044	...	21,540	...	21,544	43,084
Total	...	12,144	...	34,890	...	21,544	56,434
13. SOCIAL WELFARE HALLS							
Capital Expenditure ...	...	10,000	...	50,000	...	50,000	100,000
14. AFRICAN URBAN HOUSING							
Capital Expenditure ...	...	15,000	...	75,000	...	75,000	150,000
15. GOVERNMENT PROVINCIAL REBUILDING PROGRAMME							
Capital Expenditure ...	...	15,000	...	70,000	...	70,000	140,000
16. SURVEYS							
Capital Expenditure ...	...	20,000	...	100,000	...	—	100,000
TOTAL CAPITAL EXPENDITURE	...	914,907	...	2,778,489	...	955,635	3,734,124
TOTAL RECURRENT EXPENDITURE	...	210,038	...	1,486,623	...	2,291,100	3,777,723
TOTAL	...	£1,124,945	...	£4,265,112	...	£3,246,735	£7,511,847

PART II.

	Capital.	Recurrent.	Total.
	£	£	£
1. Education ...	239,661	1,628,715	1,868,376
2. Health ...	744,625	1,069,679	1,814,304
3. Water Supplies ...	39,670	191,622	231,292
4. Agriculture ...	250,735	517,495	768,230
5. Stock Improvement Centres ...	30,648	108,008	138,656
6. Forestry ...	12,935	102,862	115,797
7. Stabilisation of Lake Level ...	160,000	—	160,000
8. Flood Water Control Lower River ...	250,000	—	250,000
9. Roads ...	1,075,000	—	1,075,000
10. Air Transport ...	256,800	52,990	309,790
11. Posts and Telegraphs ...	170,700	60,268	230,968
12. Public Relations ...	13,350	43,084	56,434
13. Social Welfare Halls ...	100,000	—	100,000
14. African Urban Housing ...	150,000	—	150,000
15. Provincial Rebuilding Programme ...	140,000	—	140,000
16. Surveys ...	100,000	—	100,000
Total	£3,784,124	£3,777,723	£7,511,847

Note. It is recommended that approximately half the expenditure under Item I, Education, namely £890,280 (see Head E. under Appendix I) and the whole of the expenditure under Item 15, Provincial Rebuilding Programme, namely £140,000, should be met from Protectorate revenues, leaving a sum of £2,963,366 in respect of recurrent expenditure and £3,518,201 in respect of capital (including special) expenditure to be met from grants under the Colonial Development and Welfare Act.

INTERIM REPORTS BY POST-WAR DEVELOPMENT COMMITTEE.

No. 1—PROGRESS.

YOUR EXCELLENCY,

We were appointed a Committee to consider and to report on Post-War Development schemes in Nyasaland in March 1943 and we now submit an Interim Progress Report.

2. The subjects which we have considered are: the Education of all races in the country; Public Health, the training of Hospital Assistants, Sanitary Assistants and Nurses, a Mental Hospital, Dispensaries on Private Estates, certain diseases, and a Group Hospital and Medical Training Unit; Agriculture, both European and Native, and Animal Husbandry; the Amalgamation of the Agricultural and Veterinary Departments; the Railway Debt and Freights; co-ordination of Commercial Motor Transport, development of Road and Rail facilities, the establishment of Area and Provincial Road Boards, the development of Lake Port facilities; Land usage; Forestry; the development of Telegraph, Telephone and Broadcasting facilities; Electric Light and Power supplies; Water supplies; Mining; the Demobilisation of European and of Native soldiers; a Topographical Survey of the Protectorate.

3. We have not completed our consideration of all of these, or of certain other problems, but, as and when we consider that we have reached a final stage in our deliberations on any particular item, we propose to issue Interim Reports. We have reached that stage in the case of Education, and we are submitting an Interim Report.

4. Items which we have already recommended for immediate or early attention are:—A visit of inspection by qualified women to advise upon the problem of the education of African Girls; an Experimental Wing for Mass Education at the Jeanes Centre; the teaching of English at a progressively earlier age in the schools; the rectifying of the salaries paid to African Teachers in all schools; the engagement of European Women Welfare Workers; the opening of a Polytechnic and the concentration of all Technical training; the provision of a proper Mental Hospital; a scheme for Dispensaries on Private Estates; Tuberculosis Survey; the establishment of Leper centres; the inauguration of a local Shoe Industry in connection with the incidence of Hook-Worm amongst Africans; the opening of Venereal Disease clinics; a guaranteed price to encourage the growing of Rice; the growing of Tung Oil trees by Africans in the Northern Province; the opening of Stock Farms in the Northern Province; the inauguration of bulk storage for Fuel Oil in Nyasaland; an examination of certain Lake Port works at Kota-Kóta, Nkata Bay, Florence Bay and Ngara; expert advice on the possibilities of stabilising the level of Lake Nyasa; the Classification of present and proposed Roads, due regard being had to the density of traffic and to their economic potentialities; legislation for the conservation of the Natural Resources of the land; an experiment with a Mobile Post Office van; the assessment of monthly Telegraph Trunk Calls on a sliding scale; the issue of a 'Questionnaire' to Europeans from Nyasaland serving with the Forces regarding their ideas and intentions for Post-War employment.

We understand that attention is now being given to these prior recommendations.

5. We trust that our difficulties in making approximate estimates are realised. We are not a competent body to make technical estimates, and we are loth to suggest that firm estimates should be made by the Departments concerned unless and until it is known that the relative proposals are likely to be given favourable consideration. Moreover, we realise that the estimating Departments are faced with unusual difficulties in making firm estimates in war time, either for materials or for freights.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*).

G. H. ADAMS.

W. TAIT-BOWIE.

M. P. BARROW.

H. G. DUNCAN.

A. F. BARRON.

J. A. LEE.

+ FRANK NYASALAND.

J. MARSHALL.

YOUR EXCELLENCY:

The Post-War Development Committee beg to submit this Interim Report upon the Education of all races in Nyasaland. The Committee proposes, if this is acceptable, to submit Interim Reports upon the various subjects which it has considered with a view to the later amalgamation of these reports in a final report. It is, of course, possible that we may wish to make alterations when our full report on Post-War Development is submitted.

We have had the benefit of discussion and consultation with Mr. C. W. M. Cox, the Secretary of State's Educational Adviser, with various persons engaged in educational work, and we have had the opportunity of studying the recommendations for a Five-Year Plan which have been made by the Education Advisory Committee.

I. African Education.

POPULATION AND OTHER STATISTICS.

The estimated (1942) African population in round figures is 2,140,000, of which 922,900 are under 18 years of age and of whom 481,600 are boys and 441,300 are girls. It is not possible to give school age figures. This proportion between the sexes is apparently reversed in adults, of whom 525,200 are estimated to be men and 691,900 women.

The returns for 1942 showed a total of 173,692 pupils with an average attendance of 123,083 at school; and detailed examination of these figures indicate the increasing inability of the primary schools to support secondary, let alone professional, training.

The number of teachers in training in 1942 was 608 as compared with 688 in 1941, and the number of African certificated teachers fell from 1,210 in 1941 to 1,180 in 1942.

1. PRIMARY EDUCATION.

We preface our remarks upon the education of the African population with our opinion that it will be of little avail if adequate provision is not made for the education of African girls and women, the most conservative, and perhaps the most difficult, elements in the native population.

It will be a matter for close investigation to what extent the lag in female education can be made up in the general improvement in educational facilities recommended in this Report; and to what extent special measures for the encouragement of the education and training of women and girls will be necessary. Such encouragement should include recognition of the value of the work of trained African women.

It will be observed that in the teachers' salary scales recommended by the Advisory Committee on Education (see paragraphs 27 and 28 below) the principle of equal pay for equal work has been adopted except in the case of the lowest grade of African women teachers. We are, however, more than doubtful of the principle, especially with Africans; and we understand that the African members of the Education Advisory Committee were much opposed to it.

We recommend and Mr. Cox has agreed that English should be taught as the basic language in African Primary Schools at a progressively earlier age than at present, beginning in the third year of the Primary School course; simple oral English might well begin a year earlier. Indeed, Nyasaland is, by reason of its contacts with Northern and Southern Rhodesia and with the Union of South Africa, well situated for the teaching of English; and we think that in due course all the King's subjects should be enabled to read, to speak and to write the King's English. The vernacular should, we think, continue to be the medium of instruction at the early part of the primary course.

We consider that Government should ultimately accept responsibility for the free primary education of the juvenile African community, using approved existing institutions where it is desirable to do so and assuming full control and entire financial responsibility. (The Bishop of Nyasaland strongly dissents from this expression of opinion on the ultimate future of the control and of the finance of primary education, as he considers that full control by Government would not be in the best interests of education defined as Government has always been careful to define it, i.e. as a balanced development of the whole personality, character as well as intellect, on a basis of sound religion). Mr. Cox agreed with this recommendation, but he was not convinced that the general abolition of fees should have an immediate priority. The evidence as regards the payment, or non-payment, of fees by natives who attended school was conflicting, but the general opinion seems to be that, at this stage of development, the payment of reasonable fees at uniform rates leads to regular attendance. We, however, adhere to the principle of free primary education.

In this connection we comment upon the varying rates of fees which have been charged by the Missions, the average of which seems high in comparison with the rates of wages and standards of living prevailing in Nyasaland. We deprecate the practice by which a higher fee has been charged for the successive years of the Primary course; and we recommend the adoption of a flat rate for the various years of each main stage of the school course in the various areas. We also consider that the effects upon attendance of experimentally abolishing fees in one or two selected areas should be observed.

Free, but compulsory, universal education should be the ultimate aim for primary courses. We consider it desirable that primary schools should be provided within the reach of all African children living at home; and that attendance at Government schools should not be enforced where efficient Mission schools are already available.

One of the main deterrents to the proper education of young Africans is the lowness of the salaries paid to teachers in Mission schools. The Missions have varying scales of salary for their teachers, and we are emphatically of opinion that there must be unified scales for all Missions. It is most desirable that the drain of African teachers to other employment should be stopped so far as possible by Government; and that the top grades of teachers should be paid a sum at least commensurate with the salaries paid to *e.g.* the top grades of the Government clerical service. The question of teachers' salaries is a major issue in the educational development of the country and it is essential that early action should be taken.

It will be seen later in this report that a great advance has now been proposed both as regards development and as regards the proper control of education.

2. SECONDARY EDUCATION.

There are African Secondary Schools at Blantyre and at Zomba. These schools, although each is under a Board of Governors containing Government nominees, have, so far, been staffed by the Church of Scotland and Roman Catholic Missions respectively. They were built entirely from Government funds, and their recurrent revenue is obtained from Government grants. No fees are now charged. We point out that neither the Blantyre nor the Zomba Secondary school is yet filled to its capacity (in 1943 the enrolment of the two schools together was 44 and the capacity 120) and that it is incumbent upon Government to ensure that capacity is reached. Despite this, the period before which another Secondary School, we suggest in the Northern Province, will be needed is likely to be short, and we are of opinion that this, the third, Secondary School should be a Government institution giving right of entry to the Churches for religious instruction.

3. VOCATIONAL TRAINING.

We recommend that an Industrial Training Centre, or Polytechnic, where both elementary and specialised courses could be given, should be instituted. We consider, further, that the proposed Institution should be the centre of a scheme incorporating existing Missionary and other vocational training institutions. We consider that *e.g.* the Agricultural, Veterinary, Forestry and Public Works, Posts and Telegraphs etc., Departments should all have their training schools at this one centre and that "departmentalism" should be stopped. We realise that it will be necessary for certain literary subjects to be taught and we are of opinion that clerical courses should be taken at this centre. We do not consider that the Polytechnic should become purely an Education Department institution, and we advise that the Principal should be a non-technical officer.

It will be seen that our proposals for one institution are intended to avoid dissipation of effort, unnecessary duplication of certain of the staff and the obvious economy in building costs. It is our earnest hope that the Institution which we recommend should not be deferred until the post-war years. We have in mind that it should serve the needs of the African, Asian and the Coloured population. We understand that it may be possible for the Northern Rhodesia Government to participate in the proposed institution.

4. HIGHER EDUCATION.

We advise that, as and when suitable African candidates for Higher Education are forthcoming, steps should be taken to satisfy their aspirations either by a system of extra-territorial bursaries and scholarships or by regional provision. We understand that action which is being taken by the Director of Education will probably reveal that there are Africans now in employment to whom it will be well worth while giving Higher Education by means of bursaries.

II. European Education.

5. PRIMARY EDUCATION.

We advise that Primary education only should be given in Nyasaland for so long a time as we can foresee. We advise, further, that Government should provide facilities for the compulsory Primary education of European children and that this should include free tuition. As regards free boarding, we consider that, in view of the scattered nature of the European population, and of the necessity for Central European Primary Schools, it would be necessary to make a concession of free boarding in some cases.

6. SECONDARY EDUCATION.

It follows from our recommendation regarding Primary Education for Europeans in Nyasaland that Secondary education, up to Matriculation standard, should be obtained, as it is to-day, at educational establishments outside Nyasaland, but within the African Continent. Because Government does not provide for Secondary education in the country, for reasons of health, we consider that assistance towards Secondary education should continue to be given by means of bursaries. In our opinion the same principles should be applied to the Secondary education of Asians and of Coloured persons.

We deal in more detail with the non-African Secondary education problem in our recommendations under the Five Year Plan.

7. VOCATIONAL TRAINING.

We consider that provision should be made for the extra-territorial vocational training of Europeans, especially for those whose training has been interrupted by the war, and in the case of the latter we advise that Government should consult with neighbouring Governments in the near future.

8. HIGHER EDUCATION.

We consider that open selective scholarships for University or professional Training College courses should be instituted as soon as possible. We do not advise that these scholarships should be confined to Universities or other institutions in Africa only; and we consider that similar scholarships should be instituted for Asians and for Coloured persons.

III. Asian and Eur-African Education.

9. PRIMARY EDUCATION.

Here we refer back to the facilities which we recommend should be given for the Primary education of European children in paragraph 5, and recommend that similar provision should be made for Asian and Coloured children.

10. SECONDARY EDUCATION.

In this case also we refer to our remarks in paragraph 6 above in recommending similar provision.

11. VOCATIONAL TRAINING.

It will be seen from paragraph 3 above that we recommend Vocational training for Asians and Eur-Africans should be given at the proposed Polytechnic.

12. HIGHER EDUCATION.

In these cases our recommendations are similar for those made in the case of Europeans, see paragraph 8 above.

IV. The Five Year Plan.

13. With these preliminary considerations in mind we now turn to discuss the Five Year Plan which has been submitted by the Director of Education in consultation with the Advisory Committee on Education in Nyasaland.

Arising from previous consideration of educational problems by our Committee, and from the visit of Mr. Cox, the Secretary of State's Educational Adviser, the Nyasaland Advisory Committee on Education was asked to formulate a five year plan for the education of all races in this country.

The Post-War Development Committee's views upon that plan are as follows:—

African Education.

14. CONTROL OF TEACHERS IN AIDED SCHOOLS.

The Committee agree that a rule should be made under the Education Ordinance to the effect that:

appointments, re-appointments, transfers, resignations, suspensions and dismissals of teachers in respect of whom a grant is payable by Government should be reported forthwith to the Director of Education by the Manager of the School or Schools concerned for confirmation or otherwise, after due investigation; and that when the Director confirms the dismissal of a teacher that teacher shall not be re-employed in any Aided School. If the Director does not confirm the dismissal of a teacher he should be allowed to authorise his employment in the School of another Manager.

15. PAYMENT OF TEACHERS' SALARIES IN AIDED SCHOOLS.

The Committee agree that a new rule should be made under the Education Ordinance that a condition of grants-in-aid should be that the salaries of teachers in respect of whom grants-in-aid are made to Aided Schools have been paid to the teachers themselves on scales laid down in rules under the Ordinance, provided that the applicable Government grant is paid in full.

16. QUALIFICATIONS OF EUROPEAN TEACHERS IN AIDED POSTS.

The Committee agree that a new rule should be made under the Education Ordinance that:

(a) In Teacher Training Institutions, the holders of grant-aided posts must possess the Teachers' Diploma of a recognised University or a Board of Education Teacher's Certificate, or their equivalent.

(b) In other aided European posts the holders must possess the degree of a recognised University and/or a Teacher's Diploma of a recognised University or a Board of Education Teacher's Certificate, or their equivalent.

(c) In most exceptional cases it should be competent for the Director of Education to give written permission to European teachers not in possession of the above qualifications to hold a grant-aided post.

17. ADMISSION AND EXPULSION OF PUPILS FROM AIDED SCHOOLS.

The Committee agree that a new rule should be made giving parents and guardians the right of appeal to the Director of Education when children have been refused admission to, or are expelled from, State-aided Schools.

18. TEACHING OF ENGLISH BY AFRICAN TEACHERS.

The Committee advise that legislative action should be taken to ensure that English should not be taught in any school by an African teacher unless the teacher is in possession of an English Grade Certificate, or a Vernacular Grade Certificate endorsed by the Director for the specific purpose of teaching English, or such higher qualification as may be approved by the Director.

19. WITHDRAWAL OF GRANTS FOR INEFFICIENCY.

The Committee consider that there should be a rule making it possible to withdraw, or to reduce, grants-in-aid to schools of all categories for inefficiency, after due notice of that inefficiency has been given to the Manager and Mission in Nyasaland.

20. EFFICIENCY BARS IN AFRICAN SALARY SCALES.

The Committee agree that a rule should be made that the passing of efficiency bars should depend on attendance and satisfactory progress at refresher courses approved by an Education Officer, and on satisfactory annual reports on the teacher's work during the period preceding the bar.

21. LENGTH OF SCHOOL YEAR AND DAYS IN AIDED SCHOOLS.

The Committee agree that the periods should be:

150 days minimum in aided Village Schools and in classes in aided Central Schools below Standard I.

180 days minimum in all other aided schools.

The minimum length of the daily session should be:

3½ hours secular instruction in aided Central Schools.

3 hours secular instruction in aided Village Schools.

22. FEES TO BE CHARGED IN AIDED SCHOOLS.

The Committee agree that no fees either for tuition or boarding should be charged in aided Teachers' Training Schools. In other aided boarding schools the boarding fee should be subject to the Director's approval.

The Committee advise that the following tuition fees may be charged in other aided schools :

Village Schools and in Central Schools below Std. I—Maximum—6d. per annum

Central Schools—Std. I—III **Maximum—3/.**

Station Schools---	...	..	Maximum—6/-	..	..
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There should be provision for the remission of fees in cases of proved poverty.

28. ANNUAL LEAVE OF AFRICAN TEACHERS IN AIDED SCHOOLS.

The Committee agree that African teachers in respect of whom grants-in-aid are paid should be entitled to 30 consecutive days holiday per annum, exclusive of normal travelling time; and that they should be allowed to accumulate this leave, over two years, with the approval of their School Manager. Normally such leave should be granted by the Manager during school vacations. During the remainder of the year they should be available for educational service.

24. SCHOOL ATTENDANCE.

The Committee agree that Managers should have power to exclude from any aided school, for the remainder of the school year, any child who is absent for two consecutive weeks without leave, or valid excuse. No right of appeal against the exercise of this power should be allowed under the provisions of Paragraph 17 above.

25. DISTRICT SCHOOL COMMITTEES.

The Committee advise that a District School Committee should consist of:

The District Commissioner, *Chairman.*

An Education Officer, who should be Secretary
A Member of the Medical Department
A Member of the Agricultural Department

From the District concerned and if no Officer is available, from the Province concerned.

6 persons nominated by the Managers of Schools in the District and appointed by the Provincial Commissioner, of whom at least 2 should be Africans.

3 Africans selected and appointed by the Provincial Commissioner, of whom one should represent the Native Authorities concerned in the District and the others be chosen on general educational grounds.

It is considered that, in making appointments from the panel of names submitted by the Managers of Schools in the districts, the Provincial Commissioner should take into account both the quality and quantity of the educational work undertaken in the District by the Schools concerned. It is also considered advisable that, if the educational requirements of a District justify it, the Provincial Commissioner of the Province and the Director of Education should confer in order to make joint recommendations for increasing the membership of any District School Committee. The Committee consider that members of District School Committees should be appointed for three years, but be eligible for re-appointment; and that in the case of inability to attend a meeting the absent member should nominate a substitute, subject to the approval of the individual by the Chairman.

Generally in this connection the Committee consider, in view of the past history of District School Committees, that every care should be exercised by the persons charged with appointments to, and with the chairmanship of, these Committees, to ensure that they should not be allowed to become bodies on which sectarianism has an undue influence.

26. EXPENDITURE OF INCOME IN AIDED SCHOOLS.

The Committee advise that a rule should be made to the effect that the income of an aided school both from fees and from grants-in-aid, should be used exclusively for the purpose of education and payment of salaries in that school, but that in the case of Village and Central Schools this principle should be allowed to apply to a group of Aided Schools under a single Manager.

27. GRANTS-IN-AID, EUROPEAN TEACHERS, INSTRUCTORS AND SUPERVISORS IN AFRICAN SCHOOLS.

The Committee agree that grants should not exceed:

Teachers' Training Institution	Principal	£300	per annum
	Assistant	£250	
Station School	Principal	£250	
	Assistant	£200	
Women's Teacher Training ..	Principal	£250	
Schools and Girls' Boarding	Assistant	£200	
Village and Central Schools ...	Supervisors	£200	

Relief grants at the rate of £60 per annum for posts of £300, £50 for posts of £250 and £40 for posts of £200 should be provided to enable the employment of a suitable relief teacher or supervisor approved by the Director of Education when the holder of the post is on furlough.

It is assumed that over a five-year period the holder of the post would be on leave for one year. During absence the grant in respect of the holder of the post would continue and there would be accumulated funds for the employment of a suitable relief. If the suitable relief is not available the relief grant *pro rata* should be refunded.

Grants for Supervisors of Village and Central Schools should continue for a limited period, which period should be settled as soon as possible, during which African Supervisors should be trained to replace them.

28. GRANTS-IN-AID, AFRICAN TEACHERS, INSTRUCTORS AND SUPERVISORS.

The Committee do not consider that the scales of salary proposed by the Nyasaland Advisory Committee on Education for African Teachers, Instructors and Supervisors are sufficient: neither do they consider that the finances of Missions should, in effect, lay down the standard of salaries to be paid in the African teaching profession. The Committee is aware of the financial difficulties facing Missionary Societies at the present time and that Missions have other than educational commitments as well as Unaided Schools to maintain. The Committee is deeply sensible of the work which has been, and is being, done by Missionary Societies, and of the somewhat minor share which Government has taken, until recently, in the education of natives in Nyasaland.

With these factors in mind, the Committee is of opinion that Government grants for teachers' salaries in aided schools should be gradually augmented so as to enhance the scales until they are comparable with those laid down for Government Schools, viz:—

Grade I—£45 x £4 to **£75** x £5 to **£100**;

Grade II—30 x £3 to **£45** x £4 to **£75**;

Grade III—£21 x £2 to **£27** x £3 to **£45**.

In these circumstances, and although they are an improvement on existing rates and the multiplicity of Mission School scales, the Committee can only give partial approval to the following temporary scales proposed by the Nyasaland Education Committee, viz:—

Special Grade—£57 x £3 to **£69** x £3 to **£84** x £3 to **£90** x £5 to £120 per annum.

Higher Grade—£24 x £1 10/- to **£30** x £3 to **£45** x £3 to £60 per annum.

English Grade—£18 x £1 10/- to **£24** x £1 10/- to **£30** x £3 to £45 per annum.

Vernacular Grade—£12 x £1 4/- to **£18** x £1 4/- to **£24** x £1 4/- to £30 per annum.

Domestic Grade:

£9 x £1 4/- to **£15** x £1 4/- to £21 per annum.

(The figures in bold type denote efficiency bars).

The qualifications required for the above grades should be:—

Special Grade—Makerere College Teacher's Diploma or the equivalent, or promotion for outstanding merit, or to posts of special responsibility.

Higher Grade—Junior Secondary Certificate and teacher training.

English Grade—The Government English Grade Teacher's Certificate.

Vernacular Grade—The Government Vernacular Grade Teacher's Certificate.

Domestic Grade—The Government Domestic Grade Teacher's Certificate.

(NOTE).

(a) A Vernacular Grade teacher who is granted an endorsement to teach English should receive two years' seniority in the Vernacular Grade.

(b) The salary of African Supervisors should be according to the certificate held, and should be on the above scales with an additional allowance of £3 per annum. Present holders of Jeanes Supervisors' Certificates should be ranked as English Grade teachers for this.

(c) Half grants should be payable in respect of married women teachers employed half-time.

(d) As a temporary measure the Director should be allowed to approve the employment of unqualified African teachers in aided posts but the grant should not exceed £5 per teacher per annum.

(e) Where compulsory contributions to a pension or provident scheme are part of an African teacher's conditions of service it should be permissible for his employer to deduct the teacher's contribution from the above salaries.

As regards the contribution to be paid by Missions in respect of salaries of African teachers, the Committee note that on the Nyasaland Education Committee:

a majority of 9 against 2 voted in favour of a fixed contribution by the Missions in respect of the salary of African assisted teachers;

a majority of 8 against 1 voted in favour of a fixed contribution of £3 per annum per teacher by the Missions;

a majority of 7 against 4 voted against Government paying the salary scales in full;

a majority of 6 against 4 voted against a contribution of £3 per Vernacular Teacher, £4 10s. per English Grade teacher, and £6 per Higher Grade Teacher per annum by the Missions.

The Committee emphasize that the African teacher in the Mission Schools is primarily the servant of the Mission, and that the Mission do not desire to surrender entire control of these teachers to Government. In the opinion of the Committee, the contribution to be paid by the Mission towards the teacher's salary should be £3 per Vernacular Teacher, £4 per English Grade Teacher and £6 per Special and Higher Grade Teacher.

In this connection the Committee draw attention to their advice that the scales proposed by the Nyasaland Education Committee should be gradually augmented until they are comparable with those to be laid down for teaching in Government Schools. This the Committee advise should be accepted by all Missions, and by Government, as a definite, and not unduly delayed, objective.

Here we refer to our disagreement with the principle of equal pay for equal work for African men and women Teachers, and suggest a two-thirds proportion.

29. CAPITAL GRANTS.

The Committee advise that capital grants up to 50% of the approved costs should be made in respect of new buildings and for the completion, extension, or permanent improvement of existing buildings at Central, Teachers' Training, Station and Girls' Boarding Schools. The sum of £25,000 as grants for this purpose is suggested, to be spread over five years.

30. PERMANENT EQUIPMENT GRANTS.

The Committee agree that for every aided Village School for group of classes below Standard I in a Central School £2 in the first of the five years, and £1 for the remaining four years should be paid as grants. The Committee further agree that for Standards I and over in aided Central Schools £4 should be paid the first year, and £2 in the remaining four years.

For grants to Teachers' Training, Station, and Girls' Boarding Schools £20 per annum is suggested as the figure.

The Committee emphasize that if a school is closed, or ceases to be aided, the permanent equipment purchased from the grant should be transferred to another aided school, and not necessarily to one of the same Mission.

31. CONSUMABLE EQUIPMENT GRANTS, INCLUDING TEXT-BOOKS.

The grants recommended are 1/6d. per pupil per annum on average enrolment in Village Schools and for classes in Central Schools which are below Standard I; from Standard I to III in Central Schools 5/- per pupil per annum on average enrolment; for classes above Standard III, 15/- per pupil per annum on average enrolment.

The Committee advise that the fees payable in all Aided Schools should entitle the pupil to the free use of all books and school materials, and that at certain Teachers' Training Institutions, at Station and at Girls' Boarding Schools, a sum not exceeding £100 per school per annum should be granted towards the cost of instruction, and materials, in approved handicraft and homecraft courses.

The Committee observe that the Nyasaland Advisory Education Committee consider that a grant of £1,000 for the first of the five years development plan should be paid towards each library at Teachers' Training and Secondary Schools and that £100 in each subsequent year should be payable. The Committee consider that libraries form an essential part of institutions as those under reference, but it is of opinion that a very much smaller sum of money could provide all the books recommended by e.g., the British Council for forming libraries in Colonial institutions. Indeed, the Committee is informed that most of the books which could be needed by natives undergoing training could be obtained for a sum of £50 by making purchases from editions such as the World's Classics, Everyman and the Nelson series. Moreover, the replacement of Standard works produced in cheap editions should not necessitate an annual sum of £100 for each library.

32. BOARDING GRANTS.

The grants suggested for Teachers' Training Institutions which charge no fee are £5 per boarder per annum and in Station and Girls' Boarding Schools £4 per boarder per annum. Where boarders attend a school for a period of less than the school year, but more than one month, *pro rata* grants should be payable. In Central Schools which have boarding arrangements, the Committee agree that grants up to £10 per school per annum should be paid.

33. ESTABLISHMENT OF AIDED SCHOOLS, OF AIDED POSTS, AND OTHER FINANCIAL ITEMS.

(A) Establishment of Aided Schools.

The Committee remark upon the small number of schools which the Nyasaland Educational Advisory Committee has recommended for assistance, but understand that the Director of

Education holds the opinion that the number of schools to be aided in the first year of the Five Year Plan is the maximum for which adequate teaching staff could be found. The schools are as follows:—

Teacher Training Schools	7.
Station Schools	9 for three years, 10 in the fourth year and 11 in the fifth year;
Women's Teacher Training and Girls Boarding Schools	10.
Central Schools	200 in the first two years, 220 in the third year, 242 in the fourth year and 266 in the fifth year;
Village Schools	450 in the first two years, 495 in the third year and 544 in the fourth year and 598 in the fifth year;

and the Committee is informed that there are some 4,034 Mission Schools now in the country, leaving, at present, some 3,376 schools which must depend upon Missions alone for their finances. These are nearly all Vernacular Village Schools.

As regards grants to assisted Teachers' Training Institutions these, in the opinion of the Committee, must be based on the maintenance of an adequate supply of teachers for the unaided as well as the aided Mission Schools. In order to maintain standards both of instruction and attainment as well as ultimate economy, the Committee advise that Teacher's training should be given in, say, two centres on the hostel system, each with its own denominational chapel in the hostel, see paragraph 38 below where we refer to establishing the main Teachers Training Centre at the Jeanes School.

It was agreed that Aided Village Schools should either develop into Central Schools within a period of four years, or else be regarded as feeders to Central Schools.

Another consideration is that isolated Village Schools in thinly populated areas may be unable to comply with the required conditions of development.

(B) *The Establishment of Aided Posts.*

The staff in respect of whom grants are paid should not normally exceed in:

(a) a Teachers' Training Institution giving one course:—European Principal, one African Higher Grade Teacher, one African English Grade Teacher.

(b) a Teacher's Training Institution giving more than one course:—European Principal, European Assistant, with African staff as for (a).

(c) Station Schools:—European Principal, European Assistant, 2 Higher Grade African, and one English Grade, African Teachers.

(d) Girls' Boarding Schools:—European Principal, European Assistant (only when number of boarders exceeds 50) one African English Grade teacher and one African Vernacular Grade teacher.

(e) Central Schools:—Four certificated teachers of whom one at least should be of English Grade.

(f) Village Schools:—One Vernacular teacher, or in Girls' Schools one Domestic Grade teacher.

In aided Village Schools and in classes in aided Central Schools below Standard I, where the Director approves, additional posts for African women teachers might be approved for the payment of grants in accordance with the Domestic or Vernacular Grade scales, in addition to those provided under (e) and (f) above. The number of such posts should not exceed 70 in the first year of development, but should rise progressively to 100 in the fifth year of the plan.

(g) The number of posts for European Supervisors to be aided should not exceed 15.

(h) In aided Central and Village Schools, provided that funds are available, aided African staff might be increased according as the number of pupils in average attendance exceeds 100, by one teacher for every 25 pupils in average attendance.

34. MISCELLANEOUS MATTERS CONCERNING THE NEW SCALE OF GRANTS FOR AFRICAN SUPERVISORS, LOSSES OF FEES, AVERAGE ATTENDANCE AND GRANTS FOR BOARDERS.

(a) The point at which African teachers should enter the new scales should be decided on the basis of an annual increment for each two years' previous teaching experience in approved schools, dating from the time when the teacher passed the Teachers' Certificate Examination.

(b) Grants for African Supervisors should not exceed £3,500 in the first year rising to £5,000 in the fifth year.

(c) Where it can be shown that an aided school cannot bear the financial loss consequent upon the proposed reduced rate of school fees in paragraph 22 above, Government should, in the opinion of the Committee, consider making compensatory grants. The Committee advise that such compensatory grants should not exceed £3,000 per annum for the whole country.

In this connection the Committee advise that, while some observers may hold that in matters of payment there are peculiarities associated with African mentality, the principle of the complete abolition of fees should be accepted by Missionary Societies, and be put into effect as soon as possible.

(d) The Committee agree that the average number of pupils per teacher in all aided Schools should not be less than 25, and that the Director of Education should lay down the establishment of Certificated Teachers in every grant-aided school. It is realised that there may be exceptional circumstances governing the average attendance in the case of Village Schools, and these circumstances should be the subject of strict enquiry by the Director.

(c) The number of boarders in respect of whom boarding grants are paid should not exceed 150 in Station Schools, 100 in Girls' Boarding Schools, 100 in Teachers' Training Institutions giving more than one course, and 50 in Teachers' Training Institutions giving one educational course only.

35. COURSES OF INSTRUCTION.

The Committee see no reason to differ from the recommendations made by the Nyasaland Advisory Committee on Education, viz.,

(1) Syllabuses should be arranged to provide three main courses:—

The Junior Course, 5-6 years, apparent age 7-12, Sub-Standard to Standard III.

The Senior Course, 3 years, apparent age 18-15, Standards IV to VI.

The Secondary Course, 4 years, apparent age 16-19, Standard VII to Matriculation.

A Central School should be defined as one giving the Junior Course and a Station School as one giving the Senior Course.

The Junior Course should be developed as the "school age" course eventually to cover the age of compulsory attendance.

Apart from the Junior Course there will be (a) over-age and other pupils in Village Schools who will never reach a Central School; and (b) infants in Kindergarten classes. Modification in the syllabus will be necessary to meet these two categories of pupils.

Admission of pupils to the Senior and Secondary courses will be by selection after examination, from pupils successfully completing the lower course.

(2) Vernacular Grade teachers may be admitted to the English Grade Teachers' Examination as external candidates on the recommendation of their School Managers. Transfer to the English Grade salary scale should only be effected when such teachers can be included in the establishment of English Grade teachers, and have this Certificate.

(3) The Director may approve the admission of women to the Domestic Grade Teachers' Examination as external candidates without attendance at a Teachers' Training Institution.

(4) Special attention should be given in the syllabus for schools of various categories to handicrafts, girls' housecraft, agriculture and village industries.

(5) A school garden should be optional for classes under Standard I.

(6) All branches of professional training should be raised eventually to the post-Senior level.

(7) An optional course of Oral English should be included for the year immediately below Standard I.

(8) The use of English as a medium of instruction should begin in Standard IV at the latest.

The Committee, however, invite attention to its advice that English should be taught as the basic language in African Primary Schools at a progressively earlier age than at present, beginning at the end of the second year of the vernacular course.

The Committee also invite attention to the literacy paragraphs in the Colonial Office Report on Mass Education and to the advice which it proffers under paragraph 48 below.

36. NATIVE AUTHORITY SCHOOLS, ESTATE SCHOOLS, ETC.

The Committee are unable to accept the proposal of the Nyasaland Advisory Committee on Education that provision should be made for assistance to Native Authority Central Schools on the same basis as that which that Committee has proposed for Mission controlled Central Schools; neither is the Committee able to accept the limiting proposal of the Nyasaland Education Committee that provision should be made for ten Native Authority Schools only during the first three years of the five year educational plan; nor is the Committee able to agree that provision should be made with the same limitations for schools inaugurated by Estates or by Companies.

A majority of the Committee is of opinion:—

(1) that in the case of Native Authority Central Schools the capital cost should ordinarily be provided by the Native Authority concerned and that the Native Authority should be eligible for Government grants for recurrent costs in proportions to be determined in each case.

It is suggested that a separate set of Education Rules should be formulated to govern Native Authority Schools.

(2) that in cases of Company and Estate Schools employers of labour should be eligible for Government assistance as in the case of Mission Schools, when their employees are not within reasonable distance of an established school.

(The Bishop of Nyasaland and Mr. Lee disagreed with the foregoing and agree with the proposals of the Nyasaland Education Advisory Committee. Mr. Duncan agrees with (2) above, but not with (1) because it differentiates in the scale of assistance and because he doubts the capability of the present Native Authorities).

The Committee agree that right of entry for religious instruction at stated times should be granted in all Native Authority, Company and Estate Schools.

37. TECHNICAL SCHOOLS AND TECHNICAL COURSES.

The Committee note that the Education Advisory Committee considers that until a Technical Adviser is appointed to the Education Department it seemed impracticable to bring professional technical training within the five year development plan.

The Committee, however, refers to, and emphasizes, its recommendation in paragraph 8 above, upon which it is understood a scheme is now being prepared, that a Native Industrial Training Centre, or Polytechnic, should be inaugurated as soon as possible by Government.

38. JEANES SCHOOL CENTRE.

The Director of Education with two members of the Post-War Development Committee were members of a separate body which examined the present and future place of the Jeanes Centre in the educational work of the Protectorate. We have had the benefit of seeing their report and we endorse its recommendations which we summarize as follows:—

(a) *Community Workers.*

It appears that some of the Community Workers have not been carrying out the work for which they have been trained, and it appears also that the original selection of some of these men and women has been faulty. Secondly we agree that, in future, the Administration, the Native Authorities, the Medical, Education and the Agricultural Departments should assist in the supervision and engagement of Community Workers, and that Community Workers who have proved to be unsuitable should cease to be employed by the Native Authorities. In this connection we are of opinion that greater care should be taken in the selection of candidates for Community Workers by District Commissioners and by the Native Authorities concerned; and it should be clearly understood by all that the Community Worker, the Native Authorities and the Village Headmen should work together on a pre-determined scheme and in close collaboration with the District Officer.

We agree that the District Officer should inspect the houses, gardens and families of would-be Community Workers before a final decision is taken as to their suitability for training in the Jeanes Centre. The sphere of their activities on their return should also be decided and the men and women concerned should be informed exactly what their future work and conditions of employment will be.

(b) As regards salaries and conditions of service for Community Workers we agree that:—

(i) in selecting candidates for the Community Worker's course a reasonable standard of education should be required. For the present the minimum standard acceptable should be good literacy in Chinyanja;

(ii) on completion of training Community Workers should be placed on probation for one year at a salary of £1 per month during which time they will prepare their Demonstration Homes and Gardens.

After successful completion of this probationary period, the salary should be raised to £1-10s. per month, to enable them to hire a worker to help in the development and upkeep of their demonstration sites, while they are doing propaganda and development work in the areas selected for their activities. No lump sum should be given with which to build a house. The Community Workers should build their own houses during their year of probation.

(iii) At the end of the fourth year after leaving the Centre all Community Workers should return for a refresher course which should last for one planting and reaping season (November to April).

Any increase in salary beyond £1-10s. per month should depend on successful completion of the course, and satisfactory reports on the field work done during their first four years.

(iv) If reports at the end of the refresher course are satisfactory the salary should be increased to £2 per month; and it may later be reviewed by the Native Authority, in consultation with the District Commissioner, and a future salary be paid according to the merit of each individual worker.

(v) A bicycle should be provided from Native Treasury funds where justified by the distances to be travelled by any Community Worker.

(vi) Community Workers should keep a Record Book and furnish regular reports on their work to their Native Authorities who will forward them to the District Commissioner for note and filing at District Headquarters. Copies of these reports should be transmitted to the Principal of the Jeanes Centre. A uniform Record Book and a General Report form should be prescribed and printed and supplied to each Community Worker.

(c) *Jeanes Supervisors.*

We understand that in many cases Missions are employing Jeanes Supervisors on work other than that for which they have been trained and, as in the case of Community Workers, the most suitable men and women have not always been selected. It is said that many Supervisors are dissatisfied because it was not possible for them to work in those schools and villages for which they had been trained because during school terms the Missions gave them other duties such as inspection and evangelistic work at long distances from their homes.

A common complaint is that these Supervisors are unable to establish Demonstration Schools and Homes because they are frequently moved from village to village by the Missions. Accordingly, we advise that those Jeanes Supervisors already trained for work with the Missions, and who are still approved as efficient by the Director of Education for receipt of a grant-in-aid, should continue to work in the Missions, but precise instructions as to the nature of the work to be undertaken by those Supervisors should be given to the Missions who employ them and the Missions should be asked for a definite assurance that they will carry out the instructions given. If a negative reply is given by the Mission it should then be considered whether the man in question, if selected, should be employed by Government as a School Demonstrator working directly under the Education Officer. We consider further that during the next five years, while the general educational development plan is, we hope, being put into force, no further Supervisors should be trained at the Jeanes School. Our reason is that there are not yet enough suitable candidates.

(d) At a meeting at which Mr. Cox, the Secretary of State's Educational Adviser, was present we were impressed by his advice that the Jeanes Centre should become an "educational laboratory" for Nyasaland. We agree:—

(i) A model Demonstration School should be inaugurated at the Jeanes Centre in which education from the vernacular stage up to Std. III, with the possibility of extending its scope to Std. VI should be instituted. Experimental work in key subjects should be carried out at this school.

(ii) Instead of the Jeanes Supervisors' Course that two short courses of 4 months' period each should be conducted annually in connection with the Demonstration School. These courses would be for Mission trained teachers and their wives.

(iii) The annual short course for Native Chiefs and Village Headmen and their wives should continue on the present lines.

(iv) The Community Workers' course of 2 years should continue, but 12 students and their wives should go each year, thus making 2 groups. The first and second year courses would overlap instead of being combined as at present. This is recommended in order to allow the Community Workers to be at the Jeanes Centre at the same time as the Chiefs and Headmen in whose areas they would work and by whom they had largely been chosen.

(v) The "refresher" course for Community Workers and their wives as recommended under (a) above should be mandatory.

(vi) An Experimental Wing should be established at the Jeanes Centre for studying "mass education", and, particularly, adult literacy schemes. At this Wing experiments should be made, material prepared and African personnel trained before intensive campaigns are undertaken in selected areas. The organization of Youth Movements could be included in the work of this Wing.

(vii) A Native Arts and Crafts section should be established at the Jeanes Centre which should also include dramatics and music, not excluding indigenous acting, dancing and singing.

(c) We understand that the present recommendations would require two additional European posts, one man and one woman and some additional African staff. It would also require the following additional works and buildings:—

New Day School block, including the Experimental Wing and a Wing for Arts and Crafts; new Model village for families in residence at the Jeanes Centre; two European staff quarters; completion of the anti-malarial scheme; installation of electric light plant; improvement in water supplies.

While the training given at the Jeanes Centre to Community Workers, Supervisors, Native Chiefs and their families has been excellent, we fear that both the District Administration and the Missions have failed to give the necessary supervision to the men and women who have been trained at the Centre. There has been much wasted effort and we regret that the Special Committee which has examined the Jeanes Centre records that in its view the training given has not always been fully appreciated, or properly utilised, by either the Missions or the Administration. We see no reason to dissent from that view.

We are of opinion that the Christian atmosphere of the Centre should be maintained and that an unconsecrated building, which could be used for un-denominational worship as well as for other school purposes, should be erected.

We are also of opinion that the staff at the Jeanes Centre in company with the District Officers should conduct regular inspections of the work being done by Community Workers and Jeanes Supervisors.

We think it appropriate to refer to our discussion with Mr. Cox in which he said that the Jeanes Centre would make an excellent place in which combined teacher training could be given instead of, as at present, diffusing all teacher training in a number of centres which are scattered through the length and breadth of the country. We do not think it impossible for the various Christian Churches to agree upon a hostel system which would allow for denominational worship, ensure the maintenance of adequate standards for teachers and, at the same time, economise in staff. This institution might well be situated at the Jeanes School where, with its Model Village life, facilities for agricultural and health work, and contacts with the Native Administration, an ideal background for teacher training has been developed during the past sixteen years.

39. SECONDARY EDUCATION.

The Committee agree that during the next five years the Secondary Schools at Blantyre and at Zomba should be able to provide a full secondary course to Matriculation.

The Committee, however, recommend that when the Secondary School at Blantyre is full, the provision of a Government Secondary School in the Northern Province should be considered. The Committee advise that grants should keep pace with these developments, which the Committee think will not be long delayed.

40. BURSARIES FOR HIGHER EDUCATION.

The Committee is of opinion that an increasing sum should be made available for bursaries for the higher education of all races in the country and note that increased provision (£2,500) has been included in the 1944 Estimates for this purpose as a one line vote.

41. EDUCATION OF GIRLS AND WOMEN.

The Committee cannot sufficiently emphasize the importance of bringing the education of girls and of women up to, or approximating to, that of African men. Indeed, the Committee has gone so far as to say that there can be no real development in education unless the needs of girls and of women are met. The Committee are fully aware of the difficulties attendant upon the education of girls and women.

The Committee understand that Government has already made proposals for a visit of inspection by two women educationalists from Great Britain with a view to settling the outlines upon which female education should be conducted; and the Committee assumes that the short

reference made to the education of girls and women in the Five Year Development Plan submitted by the Education Advisory Committee is due to a desire more fully to consider the question when the visit of inspection has been concluded.

Generally, in connection with the education of African girls and women the Committee is of opinion that European women should be engaged as Welfare Workers in the villages; and that the experiment of sending selected Native women to institutions elsewhere for further training should be made.

42. MEALS FOR SCHOOL CHILDREN.

The Committee understand that when the Advisory Education Committee recommended that experiment should be made in feeding children at those Central Schools where school meals are most needed it was not meant that any scientific nutrition experiment should be made. In the opinion of the Committee no experiments are necessary, and the proper foods for young natives are already determined.

The Committee emphasizes that in order to obtain the full benefit of a school education it is quite necessary for native children to be fed at least once a day, and the Committee consider that the meal given should be the starting meal of the day. It was understood that the cost of giving one meal a day to the pupils in all State-aided Central Schools in Nyasaland would be a maximum of £6,000 a year.

43.

European Education.

(a) PRIMARY EDUCATION.

Statistics show that the European population is about 1,850 and that there are probably about 800 children of school age and 50 reaching school age each year.

The Committee consider that the existing policy of educating European children up to ten years of age locally and of sending children above this age to schools outside the Protectorate should continue in the interests of health. So far as the Committee can see no new schools will be necessary during the next five years with the possible exception of a Day School at Lilongwe.

At present the system of primary education for Europeans in Nyasaland is that of aiding Private Schools, and if the aided system breaks down at any point it is thought that Government should provide directly the service which is withdrawn or curtailed.

Where financial assistance is necessary for primary education in Nyasaland schools the Committee consider that the tuition and boarding fees which are charged by the school in question should be allowed as a maximum bursary by Government.

The Committee is of opinion that a uniform tuition fee should be secured in the Aided Schools and that this fee should be at a lower level than that charged at present.

(b) SECONDARY EDUCATION.

In conformity with what has been said regarding the education of European children of over ten years of age outside the Protectorate, the Committee consider that, following a precedent in Northern Rhodesia, on the admission of the child to a suitable school outside the Protectorate in South Africa or Southern Rhodesia, any parent should be eligible for a Government allowance at a rate of £30 per child per annum and to no other allowance in respect of that child. This would apply to every child and the Committee understand that the maximum number of allowances would be approximately 150, viz., £4,500 per annum.

In addition to the foregoing the children of parents who are proved to need assistance beyond the £30 allowance should be eligible for bursaries. The Committee agree that the maximum bursary to be awarded per child should be the Boarding fee charged by Southern Rhodesia Government Schools for Nyasaland children.

(c) UNIVERSITY EDUCATION AND TRAINING.

Turning to the question of University education and training, the Committee is of opinion that a Scholarship scheme should be formulated on a selective, and not a competitive examination, basis, a condition precedent to candidature being the possession of a certificate of having passed an examination of not less than University entrance standard.

Thereafter the candidates should be interviewed and questioned by a small *ad hoc* Committee appointed by Government for that purpose and the records of their school lives and the results of examinations which they have passed should be scrutinized, a similar arrangement being made when the candidate is *e.g.*, in the United Kingdom.

The Committee do not consider that scholarships to Universities should be confined to pupils who have completed their secondary education in Africa and consider that Nyasaland scholarships should be tenable at any British or Dominion Institution which is approved by the Governor.

The Committee advise that the upward limit of scholarships should be £100 per annum, but that, where financial stringency is proved, the scholarship might be increased to £200. The Committee note that it is thought that 5 scholarships per annum would meet the ordinary requirements of the country.

(d) MENTALLY OR PHYSICALLY DISABLED CHILDREN.

The foregoing recommendations regarding allowances, bursaries and scholarships do not take into consideration the teaching of children whose mental or physical disabilities prevent them from going to ordinary schools. In these cases the Committee recommend that Special Grants according to the necessities of the case should be given by Government for the education of such children at special schools in Africa.

The most recent statistics show that there are some 2,039 Asians in Nyasaland, consisting of 1,391 males and 648 females. The districts which have more than 100 Asians are Blantyre, Limbe, Zomba, Lower Shire, Cholo, Mlanje and Lilongwe. Schools with boarding houses for Asians exist at Limbe, Blantyre and Zomba, and it is a matter of experience to see how far the boarding houses at those schools will meet the needs of the north of the country. While this is being determined the Committee advise that a grant aided Asian school should be encouraged at Lilongwe.

The Committee agree that during the five year development plan period the Asian Schools should continue on a grant-in-aid basis and that after the five years is concluded the provision of a Government Central School for Asians in Nyasaland should be considered.

Other matters in connection with Asian education are that it may be found necessary to raise the present rate of grants during the five year period and to provide capital grants towards structural alterations to existing buildings and for the construction of boarding hostels. Boarding grants for poor Asian children should be considered and it is thought that grants to the school to enable a reduction of fees together with a certain number of free places are preferable to giving bursaries to Asian parents.

As regards bursaries for secondary education the Committee consider that these should be made available to schools in Africa outside Nyasaland for selected pupils who have successfully completed the full course at local schools and that the basis for a bursary to an Asian should be the boarding fee usually charged—in Natal it is understood that this is £30 a year.

As regards scholarships, the Committee are of opinion that they should be awarded on the same basis as those proposed above for Europeans.

The education of Asian girls presents various difficulties and the Committee understand that local Asian Schools would be mixed and that the older girls would go to girls' schools outside the Protectorate. Generally in this connection the Committee advise that the appointment of women teachers to local schools should be considered.

No reliable statistics of the Eur-African population are available, but the Committee understand that the total number affected approximates 1,500, many of whom follow an African mode of life. The Committee considered the Resolution of the Advisory Committee on Education:—

"That since the Eur-African community is comparatively small and offers little contribution from its side, so large an expenditure from the public funds as that envisaged in the Sub-Committee's report (i.e. Sub-Committee of the Nyasaland Education Committee) is not justified, but in order to enable Eur-African children to attend African schools in Nyasaland, there should be provision for bursaries, including boarding grants."

and find themselves in disagreement with that Committee.

In the opinion of the Committee Government should, if necessary, purchase the land and put up the building for a Primary Day and Boarding School and rent it to a properly constituted Eur-African body, with legal liability to enter into commitment on, say, a 7, 14, or 21 year lease, with the option of renewal on either side, and that, in addition, Government should make a grant-in-aid to the school for recurrent costs.

The Committee are of opinion that fees on the scale approved by Government should be charged at this school and that the Director of Education should have all necessary control over the school, its teachers, its curriculum and its pupils under, if necessary, separate Education Rules.

The Committee advise that the conditions which are suggested above in respect of bursaries and scholarships should be applied *pari passu*, to Eur-Africans.

16. INTERIM RELIEF IN RESPECT OF TEACHERS' SALARIES.

The Committee understand that a request was made by the Education Advisory Committee, and submitted by the Director of Education, for the inclusion of a sum of money in the 1944 Estimates for a bonus to be given to teachers in State-aided schools, and that this sum of money was not included in the Estimates because Government was of the opinion that a five year plan of development, which would include regulation scales of salary for those teachers, should be drawn up before anything in the nature of a "bonus" was given to teachers.

Now that a five year plan, which brings with it an increased measure of control by the Director of Education over schools throughout the Protectorate, has been submitted, we consider that in order to allay discontent among teachers Government should take immediate remedial steps by paying a sum of £3 in respect of each Government certificated teacher now working in State-aided schools until such time as the scales which are proposed have been brought into effect; it being understood that consequential adjustments relating to this interim relief would be made when the new scales come into operation. It is understood that a sum not exceeding £4,000 is involved.

17. NEW EDUCATION ORDINANCE.

The Committee is of opinion that the time has now arrived when a new Education Ordinance should be drafted, bringing the control and conduct of education in Nyasaland into line with that followed in other Dependencies and including the approved recommendations of the Five Year Plan.

In this connection a majority of the Committee is of opinion that the present Education Advisory Committee should be reorganised and that there should be separate Committees for African and for non-African education, inasmuch as the problems are essentially different from those encountered in African education. (The Bishop of Nyasaland and Mr. Lee were not in agreement with the rest of the Committee that there should be separate Advisory Committees).

48. "MASS EDUCATION" IN THE COLONIES.

The Committee had before it the Report of the Colonial Office Advisory Committee on Mass Education in the Colonies and the Secretary of State's despatch No. 145 of the 31st December, 1943, together with the recommendations of the Nyasaland Advisory Committee on Education.

The Committee remark in connection with the new term "Mass Education" that it apparently includes social welfare and practical development work similar to that which has been, and is being, done in the Protectorate, and that, in some respects, work of this type has long passed the experimental stage in Nyasaland. The Committee believe this to be the case in other African Dependencies.

The Committee agree with the main point made by the Colonial Office Advisory Committee on Education (see paragraph 38 of their Report) that Mass Education methods and content must necessarily be experimental, and must be adapted to the needs of any given area, and that emphasis on literacy and popular support are the only uniform features in every programme.

The Committee welcome the Resolution of the Nyasaland Advisory Committee on Education:—

"That in view of the fact that many Missions are carrying on work which should prove helpful to the Institution of Mass Education, that all Missions have in their aided and unaided schools an unrivalled framework available for developing Mass Education and that the African Church throughout the country has large reserves of energy and interest, the Church and Missions of Nyasaland offer their wholehearted co-operation in preparing for and carrying out Mass Education in Nyasaland."

and noted that the Resolution continued:—

"It was further stressed that Nyasaland was well placed to make an advance as much preliminary work had been accomplished in combating illiteracy. Many of the projects in social welfare mentioned in the Report had already been approached. The Committee considered that the chief obstacle to any immediate action was lack of staff and that the first step should be the appointment of two Mass Education Officers who after a survey of the situation would make recommendations. It was further emphasized that it would be a great advantage if the Mass Education Officers had a knowledge of the country and suitable personnel might be seconded from Nyasaland for training."

The Committee do not, however agree with the Nyasaland Advisory Committee on Education in saying that the first step should be the appointment of two Mass Education Officers. Indeed, the Committee consider that Mass Education, by which the Post-War Development Committee means African welfare and development combined with literacy, should not be allowed to become a departmental matter, but one for co-ordination throughout the various educative activities of the country.

In the opinion of the Committee welfare and development work should continue as at present, and be increased as funds permit, and, at the same time, experimental work should be done at the Jeanes School by opening an Experimental Wing for adult literacy where material would be prepared and Africans be trained for intensive literacy campaigns in selected areas. The necessary staff should be posted to the Jeanes School at this initial stage.

The Committee are also strongly of opinion that mass literacy as a component part of native welfare and development work should not become a purely official undertaking and certainly not a departmental one. It was stated that in addition to Missions both planters and business men would gladly participate in any mass schemes for native betterment. In so far as literacy alone is concerned, the Committee consider that adults must be taught in Chinyanja, Yao and Tumbuka at least, and that English should be used as early as possible for the elementary literacy training of children.

In this connection the Committee wish to emphasize a suggestion made by the Director of Education, which was tentatively discussed with the East Africa Command Mobile Propaganda Unit during its recent visit to Nyasaland, that the Unit is a nucleus for an organisation which could, in the pictorial sense at any rate, help in making an educational drive on a large and inter-territorial scale. The Committee does, however, plead that the films should be made in East and Central Africa by African actors and by British films. Many Africans are notably "photogenic" and African, not European, humour is an essential ingredient in any film intended to "uplift" African audiences. We deplore the consistent debauching of the African by most of the films which he sees in towns, and we fear their effect upon the outlook of the much travelled natives of Nyasaland.

V. African Reading Matter.

49. It is advised that a small Book Selection Committee should be formed forthwith to examine the reading matter suggested by the Colonial Office Advisory Committee, and that already in preparation in Nyasaland, which should, in the opinion of the Committee, contain works with an entertainment value. It was thought that this Committee should include at least one planter and one Missionary, and it was stated that employers would gladly assist in distributing literature.

VI. Conclusion.

50. We attach two Appendices to this Report, the first is a summary of our recommendations and the second is an estimate of the capital and of the recurrent costs which our recommendations, if accepted, would entail. These estimates of cost are necessarily approximate and are based upon present levels, we have no means of ascertaining what post-war costs will be.

By the use of the letter N or the letter C in Appendix II we indicate our opinions whether the cost should be a debit against Nyasaland funds or whether the object is suitable for an application under the Colonial Development and Welfare Act. We would accord high priority to our recommendations regarding the institution of a Polytechnic, and for ameliorating the salaries of African teachers in Mission schools.

51. We are deeply conscious that it will be impossible for the revenue of Nyasaland to bear even the proposed recurrent costs shown in Appendix II to this Report, more especially when it is realised that other recommendations which we shall make will require large sums of money. We have, however, thought it our duty to set out what is, in our opinion, a reasonable scheme for the proper education of all races in this country: for it is clear beyond all doubt that without education little progress can be made.

We trust that it will be possible for our neighbours to participate, on a contributory basis, in certain of the proposals which we have made.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*).

G. H. ADAMS.

W. TAIT-BOWIE.

M. P. BARROW.

H. G. DUNCAN.

A. F. BARRON.

J. A. LEE.

+ FRANK NYASALAND

J. MARSHALL.

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

APPENDIX I.

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APPENDIX 2.

ESTIMATED INCREASE OF EXPENDITURE OVER 1944 PROVISION.

a. CAPITAL.				1st Year	2nd Year	3rd Year	4th Year	5th Year
				£	£	£	£	£
N	African Secondary School	..	...	—	—	—	5,000	—
C	Polytechnic	...	...	50,000	—	—	—	—
<i>Five Year Plan:—</i>								
C	Capital Grants	...	...	5,000	5,000	5,000	5,000	5,000
C	Jeunes Centre	...	...	4,500	—	—	—	—
C	Eur-African Education	...	...	5,000	—	—	—	—
Total Costs				£54,500	5,000	5,000	10,000	5,000
Less amount provided in 1944 Estimates				5,500				
Additional Amount Required				£59,500	Nil	Nil	5,000	Nil
A. RECURRENT.								
N	Government African Secondary School	...	...	—	—	—	—	2,000
C	Polytechnic	...	...	—	—	8,000	8,000	8,000
<i>Five Year Plan:—</i>								
Grants-in-aid of African Education:—								
C	European posts	...	...	17,580	17,580	17,580	18,120	18,660
C	African teachers	...	...	22,065	23,938	26,646	29,767	33,180
C	African Supervisors	...	...	3,500	3,500	4,000	4,500	5,000
N	Permanent Equipment	...	...	2,220	1,370	1,455	1,568	1,690
N	Consumable Equipment	...	...	7,000	7,000	7,700	8,469	9,315
N	Boarding	...	...	10,250	11,250	12,600	13,960	14,680
N	Special Equipment	...	...	2,600	2,600	2,600	2,700	2,900
C	Libraries	...	...	500	50	50	50	50
N	Compensation for Fees	...	...	3,000	3,000	3,000	3,000	3,000
N	N.A. Schools	...	...	1,200	1,200	2,400	3,600	4,800
N	Secondary Schools	...	...	3,200	3,600	3,800	4,000	4,000
N	Higher Education	...	...	500	700	900	1,100	1,200
N	School Meals	...	...	6,000	6,000	6,000	6,000	6,000
C	Jeunes Centre:—							
	Additional Expenditure	...	...	1,020	1,074	1,128	1,182	1,236
N	European Education.							
	Grants-in-aid	...	...	1,800	1,800	2,000	2,100	2,100
	Allowance for Secondary education	...	...	4,500	4,500	4,500	4,500	4,500
	University scholarships	...	...	200	400	600	800	1,000
N	Asian Education.							
	Grants-in-aid	...	...	750	800	850	860	900
	Boarding grants at £18	...	...	360	540	720	720	900
	Bursaries for Secondary education at £40	...	...	200	400	600	800	800
	University scholarships	...	...	200	400	600	800	1,000
N	Eur-African Education.							
	Primary	...	...	3,400	3,600	3,900	4,200	4,500
	Secondary	...	...	720	770	820	870	920
C	Mass Education.							
	Material	...	...	1,000	1,000	1,000	1,000	1,000
	African Reading Matter	...	...	1,000	1,000	1,000	1,000	1,000
Total Costs				£94,665	98,172	106,449	123,656	124,291
Less Amounts Provided in 1944 Estimates				£28,765	28,765	28,765	28,765	28,765
Additional Amount required				£65,900	69,407	77,684	94,891	95,526
SUGGESTED DIVISION OF RECURRENT EXPENDITURE.								
Additional Amount required from Nyasaland Funds				£19,235	21,265	18,280	31,272	27,400
Amount required from Colonial Development and Welfare Fund				£46,665	48,142	59,404	63,619	68,126
TOTAL				£65,900	69,407	77,684	94,891	95,526

YOUR EXCELLENCY:

The Post-War Development Committee beg to submit the following Interim Report upon Public Health and Medical matters in Nyasaland.

I. Medical Policy.

At the outset we remark that the fundamental needs of Public Health are the same in most Colonies and are governed by the same principles. We do not consider that medical problems are separate and distinct in a tropical country from other social problems; and we do consider that all medical work should be a co-operative effort in which officials and unofficials should be organised to take their part. We stress the need for close professional liaison between neighbouring territories. We consider that the aim which should govern medical policy in Nyasaland is gradually to set up a Medical Service which would be free for all patients.

2. We consider that the primary aim of medical services should be to raise the general standard of Public Health by eliminating preventable diseases and by controlling the transmission of all diseases. Obviously special attention should be paid to the health of mothers and of children and to the general health education of the adult population. Prevention is better than cure, but curative work is of great importance.

3. It is, we think, idle to suppose that any tropical dependency can afford a sufficiency of imported staff to bring to the people the benefits of preventive medicine, and it follows that a staff must be obtained from the people of the country.

II. Development of the Medical Services.

4. We anticipate that the economic development of Nyasaland will call for an increase in production which, in its turn, will demand greater physical efforts from the African population. The response to this call is not likely to be satisfactory because a large proportion of the Native population suffers from the debilitating effects of malaria, hook-worm, bilharzia and other parasites. In addition, malnutrition exists to some degree.

5. If medical science is to improve the health of the African his standard of living must be raised and the full co-operation of the population must be secured. It is obvious that much could be accomplished to improve conditions in the villages by sanitation, water supplies and the reduction of preventable diseases through an efficient Rural Sanitary staff working under adequate medical supervision. To-day the rural African cannot afford to purchase cement to render his house either tick or rat-proof, to build adequate latrines, to use soap as freely as is desirable, or to wear shoes to protect him from hook-worm infection.

6. There has been no lack of appreciation in Nyasaland of the fact that patients admitted to our hospitals constitute only a small proportion of the population who are suffering from disease, or from its effects, and that, had their environment and ways of living been better, many of the patients need never have been admitted to hospital. Medical surveys carried out in 1934, 1935 and 1936 for the purposes of obtaining information about health conditions in rural areas revealed that Natives are born, live and die under the most insanitary conditions; and that, despite the long history of missionary effort, they are ignorant of the elementary principles of hygiene. European Health Inspectors are required to conduct schemes of Public Health, to enforce measures of control, and to supervise the activities of African Sanitary Assistants.

7. It is to be remembered, too, that the chances of new diseases entering Nyasaland, such as Yellow Fever, which have hitherto been regarded as negligible, are now possibilities.

8. Neither must the curative value of medicine be underestimated. Our hospitals and dispensaries are far from perfect, even though the buildings are said to compare favourably with similar institutions in other African territories. We lag behind our neighbours in the standard of nursing, diagnostic facilities, equipment and medical transport services. We are backward also in the development of Maternity and Child Welfare Clinics.

9. As regards the Rural Dispensaries, these have never been adequately supervised and the staffs are not capable of performing anything more than palliative treatment.

The Committee is of opinion that these dispensaries should become Rural Health Centres and that the staff should consist of a Hospital Assistant, a Sanitary Assistant and a Midwife. The equipment should include a microscope. In addition, there should be a dresser posted to every centre where the volume of work justifies additional help, to relieve the hospital assistant of routine treatment and to allow him to devote time to the diagnosis and treatment of conditions beyond the scope of the dresser grade. The development of Maternity and Child Welfare work at the Rural Health Centre cannot be undertaken until Nursing Sisters and Health Sisters are available to organise this work from the District Hospitals.

10. We consider also that extended laboratory services, X-ray apparatus, lighting plants and the like are essentials. We advise that X-ray apparatus and electric lighting plants should be installed at the hospitals at Karonga, Mzimba, Lilongwe, Kota-Kota, Ncheu, Fort Johnston Mlanje and Port Herald.

11. There are only two ambulances to serve the whole of Nyasaland, one belonging to the Red Cross stationed at Blantyre and the other to Government stationed at Zomba. We consider that three ambulances should be stationed at Blantyre and that ambulances should be stationed at Mlanje, Port Herald, Zomba, Fort Johnston, Lilongwe, Dedza, Ncheu and Mzimba. We believe that a simple and inexpensive type of ambulance can be made locally.

III. Medical Training.

12. The Director of Medical Services has told us that there has been no lack of continuity of Medical policy in Nyasaland. We think that a Medical Training School for Hospital Assistants should be provided before any large scale scheme for expanding the Dispensaries into Health Centres, vide paragraph 9 above, is undertaken. But there remains the insufficiency of educated personnel and in our Interim Report No. 2 we have shown how greatly the country suffers from the prevailing low standard of education.

We understand that the establishment of a joint Medical Training School, to be shared between Nyasaland and Northern Rhodesia has been the subject of recent investigation by the two Directors of Medical Services. We have been informed that the two Directors were of opinion that supposing both Nyasaland and Northern Rhodesia needed 50 trained Hospital Assistants a year, and that the period of training was 4 years, it would be necessary to have at least 200 natives undergoing training and that this would make the classes most unwieldy; further, that while it might be possible to overcome the difficulty of numbers by the provision of more staff it would not be possible to give this number the requisite clinical teaching at a joint institution.

In these circumstances, we agree with the proposal of the Director of Medical Services that a Medical Unit should be established in the neighbourhood of Blantyre containing 36 European, 17½ Native and 30 non-European and non-Native beds. This should, we consider, be constructed in separate blocks and there should be two separate operating theatres. Attached to this Hospital Unit should be a Medical Training School, which, allowing for wastage, should be designed to accommodate 4 classes of 15 students each in order to secure 12 qualified Hospital Assistants for each year after the fourth.

At the same institution should also be taught a similar number of Sanitary Assistants whose course would, however, be one of 3 years. We are informed that the staff necessary for the Hospital, the Medical and Entomological Laboratories, and for the two Training Schools would be:

- A Medical Superintendent of the Senior Medical Officer grade.
- A Surgical Specialist, appointment now exists.
- A Pathologist, appointment now exists.
- 3 Medical Officers, of whom one should be a woman.
- An Entomologist.
- A Pharmacist.
- 2 Health Inspectors.
- A Dentist.
- A Housekeeper Dietician.
- A Wardmaster.
- 12 European Nursing Sisters, including a Matron and an Assistant Matron, eight appointments now exist.

13. It will be realised that an immediate aim is to train natives as Hospital Assistants at this Unit, and to leave the higher medical education of those of outstanding ability to Makerere College in Uganda. Here we refer back to the prevailing lowness of the educational standard in Nyasaland, but we hope that much of the African staff needed for our plans will be obtained from demobilized soldiers of the East African Army Medical Corps.

IV. Nursing Training.

14. We propose that the present practice of concentrating the training of Native nurses at Zomba should continue; and we endorse the intention to continue the training of midwifery at the Church of Scotland Mission Hospital in Blantyre, where, we understand, after the war, that the Mission will also give training to Native nurses of the Health Visitor type. We are told that a certain amount of success has been achieved in the training of Native widows, but no solution seems possible to us, save the gradual spread of education and the steady raising of the standards of living, to the constant problem of the young native girl. There is also the problem of "wastage" due to early marriage.

V. Medical Staff.

15. We are advised that Medical Headquarters staff will require to be strengthened to cope with the developing services, and to ensure continuity, by the substantive appointment of a Deputy Director of Medical Services.

As regards European medical staff, 18 additional medical officers, inclusive of reliefs, are required. This number will allow a second medical officer to be posted to the larger hospitals and allow one medical officer to be available at all times in the district headquarters while the other is on tour in his own district or in the districts under his supervision. We recommend that three of these appointments be filled by women doctors with previous experience of Maternity and Child Welfare Work and/or School Medical Inspection and that one third of the remaining posts be filled by men with the Diploma of Public Health.

16. With regard to European Nursing Staff, there is need for 80 more Nurses, preferably over the age of 35 years, of whom 50% would be required for the duties of Health Visitors, but here, also, we must remark upon the "wastage" due to marriage. (A scheme which we think has possibilities would be for an administrative and financial arrangement to be made with South Africa and/or Southern Rhodesia to provide nurses on two years secondment on their approved rates of salary plus a tropical allowance and travelling expenses). These Health Visitors should, we consider, be stationed with the Nursing Sister in charge of the District Hospital, and we advise that each hospital of 50 beds or more should also have one European Nursing Sister in charge under the European Medical Officer.

In order to deal with the preventive aspect we have been informed by the Director of Medical Services that 18 additional Health Inspectors will be necessary and that one Medical Officer of Health will be required for the townships of Blantyre and Limbe. Nutrition is an important branch of preventive medicine and we recommend the appointment of a male Nutritional Adviser whose duty it would be to advise on the measures to be taken to deal with certain of the recommendations of the Hot Springs Conference, to investigate nutritional problems as they arise, to institute propaganda and to collaborate with the Agricultural Département.

The African is not immune to dental decay, but, at present, no form of treatment other than extraction is open to him and we are informed that the dentistry as practised by the Native is far from satisfactory. We recommend the appointment of two dentists, one to be stationed at Lilongwe, and the other at the Group Hospital, Blantyre, where facilities should be provided for training selected student Hospital Assistants to extract teeth skilfully and to carry out simple conservation work. The dentists would be expected to tour their respective provinces, and they should be furnished with lorries and the necessary equipment in order to give treatment at schools and hospitals.

There are no qualified pharmacists in Government service. At least two are required, one to take charge of a new Medical Store, which we recommend should be at Blantyre near the Group Hospital, and the other to undertake the training of students in the compounding of drugs and in storekeeping.

In the following table details are given of the existing European and Asiatic establishment of the Department, and of the additional medical, nursing and technical staff needed for a Five Year Plan, including the Group Hospital and the Medical School and the Mental Hospital to which we refer in paragraph 12 above and in paragraph 18 below.

	Existing establishment	Additional posts required for Five Year Plan	Total establishment required for future
Director of Medical Services	1	—	1
Deputy Director of Medical Services	—	1	1
Senior Medical Officers	2	—	2
Surgical Specialist	1	—	1
Pathologist	1	—	1
Tuberculosis Officer	—	1	1
Medical Officer of Health	—	1	1
Medical Officers	14	19	33
Dental Surgeons	—	2	2
Medical Psychiatrist	—	1	1
Entomologist	—	1	1
Nutritional Adviser. (man)	—	1	1
Matron	1	1	2
Assistant Matron	—	1	1
Senior Nursing Sisters	2	—	2
Health Visitors	—	15	15
Nursing Sisters	13	15	28
Housekeeper-Dietician	—	1	1
Pharmacists	—	2	2
Superintendents (married couple) Mental Hospital	—	2	2
Health Inspectors	2	18	20
Laboratory Technician	—	1	1
Attendants (married couple) Mental Hospital	—	2	2
Wardmasters	—	2	2
Sub Assistant Surgeons	10	2	12

17. In addition to the foregoing, we are of opinion that every District Medical Officer should be furnished with a mobile motor unit to enable him to deal with cases on tour and to bring back cases to the Hospital. On Lake Nyasa a motor-boat, which could be shared with other Departments, is desirable.

(Mr. Barton and Sir William Tait Bowie think that small District Hospitals occupy too great a proportion of professionally qualified staff, and prefer larger Dispensaries which would act as clearing stations for a series of larger Hospitals to be served by motor ambulances. An objection to this is that the District Hospital and its staff form a centre of health education).

VI. Mental Hospital.

18. At present the Lunatic Asylum at Zomba is administered and maintained by the Prison Department and we consider that this control, and the building, should be abandoned as soon as possible, and that a fully equipped Mental Hospital should be built and put under the control of the Medical Department.

Enquiries have been made of Southern and Northern Rhodesia whether these territories would be prepared to participate in a scheme for a central institution. The replies have been negative. Consequently we are of opinion that provision should be made in Nyasaland for 200 mental patients, with a staff consisting of a Medical Psychiatrist, married couples as Superintendents and Attendants, and a Wardmaster.

We are not, however, satisfied that a joint institution with Northern Rhodesia could not be established in the Fort Jameson-Fort Manning-Lilongwe area.

VII. Dispensaries on Private Estates.

19. We suggest that local associations, or combinations of employers of labour, should provide the necessary funds to Government for the establishment, and maintenance, of dispensaries on agreed sites: in return for which Government would maintain and inspect these dispensaries.

VIII. Diseases.

20. We have discussed the following specific diseases:

(a) **MALARIA.** We agree with the Director of Medical Services that in areas where malaria is excessively prevalent the most important method of combating the disease in a country as Nyasaland is by treating young children so as to modify the course of the disease without retarding the development of that natural immunity which is so valuable an asset to the African in later life.

(b) **SCHISTOSOMIASIS (Bilharzia).** This disease, which is very prevalent in Nyasaland, is an instance of the need for pure and protected water supplies and for latrines.

We understand that the treatment of water by the use of malachite is now being experimented with in Southern Rhodesia, but that it has not yet been proved to be efficacious as a lethal agent against the molluscan intermediary host of this disease under Nyasaland conditions where vast sheets of water are infected.

(c) **DYSENTERY.** This, again, is a question of pure water supplies and of latrines. We consider that Government should make cement latrine plinths in a suitable form for the Native population and that, if necessary, they should be sold under cost-price.

(d) **TUBERCULOSIS.** The incidence of this disease is alleged to be heavy in Nyasaland, but the Director of Medical Services has informed us that because no investigations have been made he is unable to confirm the allegation. He considers it desirable that there should be an investigation, and we advise that a Tuberculosis expert should be obtained, together with an X-ray unit, in order to make a survey of some twelve months duration.

If this survey shows that the disease is prevalent, we advise that the proposed Tuberculosis Specialist, to whom we refer in paragraph 16 above should continue the work of the survey.

We understand that Silicosis amongst Nyasaland natives working on the mines in South Africa or Southern Rhodesia is now under reference by Government.

(e) **LEPROSY.** We advise that the opinions of Dr. E. Muir of the British Empire Leprosy Relief Association should be followed and that two Leprosy centres should be established, one in the North and one in the South of the country. We consider it advisable that these centres should be established at Missions, but, if this is not practicable, that Government should undertake the work and endeavour to obtain assistance from the British Empire Leprosy Relief Association and from Toc-H.

We have in mind the establishment of a Leper Settlement on a site in the vicinity of Salima in the Northern Province, with accommodation for 500 adult and 100 juvenile cases; and for the extension of the Malamulo Leper Settlement, on land adjoining the Seventh Day Adventist Mission, to provide additional accommodation for 240 adults and 100 juvenile patients. This would bring the Malamulo accommodation up to 500 adults and 100 juvenile patients, as we propose for the new settlement in the Northern Province. We consider this work one eminently suitable for assistance under the Colonial Development and Welfare Act.

We also consider it important that in association with the Leprosy centres there should be a system of segregation in native villages and that steps should be taken to endeavour to remove all young children from the huts of the lepers.

(f) **HOOK WORM.** Here we refer to our remarks on Dysentery, and we add that it is most desirable that the wearing of shoes should be encouraged amongst the native population. We understand that an endeavour is now being made by Government to initiate a native shoemaking industry.

(g) **VENEREAL DISEASE.** Reasonably accurate statistics relating to cases of venereal disease, (which do not include cases treated in Military Hospitals, nor those treated at Mission Centres), are as follows:—

Year	Syphilis	Gonorrhoea and its complications	Total
1933	846	359	1,205
1934	1,319	626	1,945
1935	1,508	753	2,261
1936	1,771	716	2,487
1937	2,100	731	2,831
1938	1,836	716	2,552
1939	2,188	650	2,838
1940	2,144	815	2,959
1941	3,332	919	4,251
1942	4,110	1,145	5,255

The increase during the years subsequent to the outbreak of war is significant.

We regard these diseases as more a moral and social problem than a medical one, and we are convinced that the disintegration of tribal and family life and the unhealthily heavy temporary emigration of males are the most important factors in their spread.

We quote the following extract from an address by Dr. E. H. Cluver, Director of the South African Institute of Medical Research, which was recently published in the South African Journal of Science:—

"We have some ghastly mistakes to correct. The chief among these is the herding of hundreds of thousands of young male Natives in mine compounds away from their families. The segregation policy now has few supporters and none among those who have studied its social implications. The high cost alone to the State justifies the abolition of the compound system. It is the cost not only of the treatment—inadequate though it is—of the sufferers, but of the inefficient and lost labour of the victims and their potential offspring."

Because gonorrhoea is the great preventer and syphilis the great destroyer of life social effects must follow infection. We are informed that the examination of medical returns over a number of years reveals that a very high proportion of cases have entered the secondary stage of syphilis before patients attend for treatment, and that patients suffering from gonorrhoea usually present themselves at hospitals after the disease has become chronic, or complications have occurred. Mention has been made of African methods of treatment, but there is no doubt that these methods are not successful.

It is clear that the best methods of combating these evils are the re-establishment of village life, the raising of the status of African women, the expansion of ante-natal clinics for the treatment of expectant mothers suffering from venereal disease, and the establishment of an adequate number of Rural Health Centres in charge of Africans competent to diagnose the diseases and to give the specific drugs.

More specific recommendations which we make are:—

(1) the establishment by Local Government and Native Authorities of controlled Beer Halls in as many centres as possible, in order to discourage debauches in the villages;

(2) the issue of an Order, under Section 8 (h) of the Native Authority Ordinance, Cap. 41, by Chiefs requiring cases of venereal disease brought to light during Native Court proceedings to receive treatment at a proper medical centre until the patient is certified as non-infectious by a Medical Officer;

(3) the issue of pamphlets and, in particular, the issue of a pamphlet by the Director of Medical Services and the Director of Education informing missionaries and estate owners of the nature of the propaganda which should be used in combating venereal disease.

We remark that the cinema is an important medium in this respect and we note that Government hopes shortly to obtain a suitable film for exhibition by the Mobile Cinema unit. In this connection we agree to the need for social amenities, such as the organisation of games and the establishment of clubs and reading rooms for natives.

(4) A prohibition on employers from engaging persons suffering from venereal disease in a communicable form for work, e.g. lorry driving, entailing extensive travel;

(5) the provision of drugs for the treatment of venereal disease *free of charge* to all properly staffed medical centres, whether Government or non-Government. We also consider that no charge should be made by any doctor for the treatment of natives;

(6) the postponement of the demobilisation of soldiers suffering from venereal disease until they have been rendered non-infectious.

We consider that Government should, forthwith, prepare an application under the Colonial Development and Welfare Fund Act for funds for the purchase of drugs.

We have considered the introduction of a medical certificate of fitness for marriage, and, while this is desirable, at present we do not think it is practicable.

IX. The Five Year Plan.

21. In an Appendix to this Report we set out the financial implications of our advice. The average recurrent expenditure of the Medical Department for the last ten years was £54,100, for the last three years it has been £66,000. Our proposals would increase it to £157,500, and in addition, some £153,125 is estimated on capital charges. It should be realised that the Five Year Plan is an essential preliminary to the development of the present Rural Dispensaries into District Health Units.

By use of the letter N or C in the Appendix we indicate our opinion whether the cost should be a debit against Nyasaland funds, or whether the object is suitable for an application under the Colonial Development and Welfare Act. We accord high priority to our recommendation regarding the Group Hospital and Medical Training School at Blantyre, the Leprosy Settlements, and the Mental Hospital.

The estimates of cost are necessarily approximate and are based upon the best information available at the moment. We have no means of ascertaining what the post-war costs will be and we realise how small is the average revenue of Nyasaland.

22. In conclusion, we say that unless the prime causes of the low standard of living of 2,140,000 Africans are removed no real progress in public health will be made within foreseeable time.

We have the honour to be, Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*)

W. TAIT BOWIE

H. G. DUNCAN

J. A. LEE

G. H. ADAMS

M. P. BARROW

A. F. BARRON

J. MARSHALL

(Note—Difficulties of communication prevented the Bishop of Nyasaland receiving the final draft of this report before it was necessary to print it).

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

9th August, 1944.

APPENDIX.

ESTIMATED EXPENDITURE—FIVE YEAR PLAN.

(a) CAPITAL: BUILDINGS.	1st Year £	2nd Year £	3rd Year £	4th Year £	5th Year £
C Group Hospital, Medical School, Medical and Entomological Laboratories, Blantyre ...	70,000	60,000	—	—	—
C Leprosy Settlement, Salima ...	22,700	14,440	—	—	—
C Leprosy Settlement, Malamulo ...	17,370	10,365	—	—	—
C Mental Hospital ...	14,000	11,000	—	—	—
C Four new District Hospitals with Maternity and Child Welfare Centres ...	—	29,820	6,600	—	—
N Staff Quarters, extensions to existing hospitals and six Maternity and Child Welfare Centres	34,410	4,470	18,430	27,980	—
N Rebuilding 20 existing dispensaries ...	1,800	1,800	1,800	1,800	1,800
N Improvements to 5 existing Hospitals ...	450	450	450	450	450
N Rest Houses for ambulant cases at Rural Dispensaries and District Medical Centres ...	1,784	1,784	1,784	1,784	1,784
C Rural Dispensaries (7 new Dispensaries to be built annually) ...	3,290	3,290	3,290	3,290	3,290
	£166,004	137,419	32,864	35,304	7,324
(b) CAPITAL: EQUIPMENT.					
C Equipment for Group Hospital, Medical School, Medical and Entomological Laboratories, Blantyre ...	—	30,000	—	—	—
C Equipment for Leprosy Settlements ...	2,620	1,300	—	—	—
C Equipment for Mental Hospital ...	—	6,500	—	—	—
C Equipment for four new Hospitals ...	—	3,600	900	—	—
N Equipment for existing Hospitals and extensions to existing Hospitals ...	6,350	—	650	2,150	—
C Equipment for new Rural Dispensaries ...	280	280	280	280	280
N Motor vehicles—Ambulances and Lorries ...	1,800	2,600	800	800	—
N X-ray and electric lighting plants for eight Hospitals ...	1,800	900	1,800	2,700	—
N Sanitary Equipment for Rural areas ...	500	800	1,200	1,500	2,000
	£113,330	45,980	5,680	7,430	2,280
TOTAL CAPITAL COSTS	£279,334	183,399	38,544	42,734	9,604
(c) RECURRENT.					
N European Staff ...	4,652	12,436	22,362	29,376	38,562
N Asiatic Staff ...	—	—	240	492	516
N African Staff ...	689	2,092	6,310	8,237	10,102
N Transport and Travelling ...	300	810	1,300	1,680	2,200
N Maintenance of motor vehicles ...	—	600	1,500	1,800	2,100
N Maintenance of X-ray and electric lighting plants ...	—	300	450	750	1,200
N Passages ...	1,000	1,694	3,962	4,466	5,655
N Drugs, instruments and stores ...	490	1,460	4,400	5,460	6,470
N Maintenance of patients in hospital ...	—	210	2,100	2,900	4,600
N Equipment and maintenance of hospitals and dispensaries ...	70	265	2,045	2,435	2,845
N Household equipment for nursing staff ...	300	790	515	790	270
N Sanitary measures and upkeep of Sanitary equipment ...	200	600	1,000	1,200	1,400
N Anti-malarial works ...	—	250	500	750	1,000
N Propaganda ...	50	100	150	200	200
N Uniforms ...	100	200	300	700	700
	£7,721	21,807	47,421	60,636	75,625
N Leprosy Settlements:					
Upkeep and Staff, Malamulo and	—	—	5,285	5,493	5,804
N Salima ...	—	—	5,603	5,948	6,214
N Mental Hospital: Upkeep	—	—	2,552	4,467	2,485
African Staff	—	—	900	985	1,000
TOTAL RECURRENT COSTS	£7,721	21,807	61,764	75,759	91,225
(d) SPECIAL INVESTIGATION: TUBERCULOSIS SURVEY.					
C Personal Emoluments ...	£1,823	—	—	—	—
C Other Charges ...	£1,977	—	—	—	—
TOTAL COSTS	£3,800	—	—	—	—

No. 4—CROPS, ANIMAL PRODUCTS AND THE AMALGAMATION OF AGRICULTURAL AND VETERINARY DEPARTMENTS.

YOUR EXCELLENCY,

The Post-War Development Committee beg to submit this Interim Report upon Crops and Animal Products in Nyasaland. We have had the benefit of consultation with Mr. A. S. Richardson, C.B.E., Director of Agriculture, Mr. J. de Meza, Chief Veterinary Officer, and with various other persons engaged in agricultural and veterinary work. In addition, five members of the Committee are engaged in Agriculture.

I. European Crops.

1. We are of opinion that the growing of tea and tobacco, together with tung will remain the chief European export crops. Ignoring the possible future vagaries of the market value of tobacco, we consider that there are large tracts of sparsely populated land which offers possibilities for the development of flue-cured tobacco in the Northern Province of the country. We therefore advise that Government should consider giving sufficient security of land-holding to allow approved Europeans to develop the flue-cured industry in certain areas. Certain of the areas which we have in mind suffer from a scarcity of surface water and we emphasize that facilities for obtaining the necessary water should be made available as is done in neighbouring territories.

Sir William Tait-Bowie, and Messrs. Barrow, Duncan, Barron, Lee and Marshall recommend that in the interests of the development of the country the policy outlined above should be adopted in the near future.

2. We consider that tung offers the best prospects for large scale development of another permanent crop and it is hoped at an early date to put forward proposals for assisting its development designed firmly to establish the industry as quickly as possible. So far, the trees have not shown themselves susceptible to disease in Nyasaland, and we understand that Government is investigating the growing of tung trees by natives in the Northern Province.

3. Under the grant of an Exclusive Licence, pyrethrum growing has been started in one selected area. The Licence is held by a European farmer and the crop is grown and produced by native tenants. It has not yet been proved that pyrethrum is a profitable undertaking in Nyasaland, but there is as yet nothing to indicate that the required standard of product cannot be attained. We recommend that if success attends this initial effort the extension of the industry to other suitable areas should be considered. Trial plots have already been established.

4. We advise that close experiments be made for the growing of Chinchona in view of the monopoly held by the Dutch East Indies. We understand that experiments are now being made at Vizara, Cholo, Dedza, Zomba and elsewhere, and that it was probable that some of these areas would show themselves to be suitable.

5. It is possible that the recommendations which we shall make in an Interim Report concerning road and railway freights will have a bearing upon the cultivation of "new" crops by Europeans.

II. Native Crops.

6. We consider that at present tobacco and cotton should be regarded as the main export crops for natives. Rice and groundnuts both grow well and there is an increasing internal market, but it will be necessary for native agricultural methods to improve considerably, before they can compete on the export market.

7. Other possibilities are the increased growing of potatoes and vegetables for the local and neighbouring markets, and we also consider that by co-operative measures the soya bean could be grown to advantage. Here we remark that the difficulty which has been, and is being, experienced with the growing of soya bean is that the native has not yet found this bean a palatable food, but the success met with by those who have troubled to encourage the native to take to soya, e.g. the use of soya bean milk at the Jeanes School, show that demonstrative propaganda would soon make it a popular food. The prevailing price is lower than that obtainable for other pulses.

8. The main concern in native production is to improve the standards of nutrition in Nyasaland, concerning which see Interim Report No. 2, and this means concentrating on food crops. Before considering exporting these products both markets and proper grading must be assured. Moreover, in so far as nutrition is concerned, we regard the keeping of cattle and the proper methods of animal husbandry as part of food production.

9. We doubt whether the acreage cultivated by natives should be greatly increased. The problem is to improve the productive capacity of the land and to maintain soil conservation and it is to be hoped that, in time, the native can be induced to lay down pastures. There are native areas suitable for a higher type of cattle than the local Zebu and it will be realised that the keeping of stock will enable the native to put the manure back into the soil and so preserve its structure and maintain its fertility.

10. Turning now to certain individual crops:—

(a) *Tung*: see paragraph 2 above.

(b) The acreage under tobacco grown on Trust Land by natives is 73,417 (1943) and the production figures for the last five years are as follows:—

		lbs.
1939	...	5,551,999
1940	...	7,645,490
1941	...	9,816,430
1942	...	12,436,907
1943	...	13,542,392

The estimated acreage grown by native tenants on private estates in 1943 was 29,220 additional to the above.

Inasmuch as world conditions and the American tobacco industry may cause a rapid fall in prices, the Committee consider that Government should pay early attention to the situation which would then arise and the obvious necessity for providing the native with alternative export crops.

(c) In regard to cotton, there are many areas in the country to which cotton growing could be extended and we advise that research should be continued with the object of finding disease resisting strains and of increasing the yield. The export figures for cotton lint during the last five years are:—

		Lint lbs.		Seed lbs.
1939	...	2,554,559	...	1,680,000
1940	...	2,653,254	...	—
1941	...	1,250,620	...	—
1942	...	3,737,116	...	—
1943	...	4,019,110	...	3,104,031

(d) As regards maize, this is the staple food of the people. The yellow varieties are said to possess the higher nutritive value. There is no export market in this grain, save to meet scarcity in neighbouring countries. The Nyasaland type does not conform with those favoured on export markets, and if maize is to be grown for export the fashions of those markets must be studied.

In connection with grain crops, we notice that the natives of Nyasaland still adhere to the old mortar and pestle methods of grinding grain and we advise that every endeavour should be made to introduce the simple native water-mill, which is now in considerable use in various East African territories.

III. Animal Products.

11. We consider that a proper economy requires the intelligent keeping of cattle by native and that the European livestock industry, with its ancillaries, could be developed. We consider the first aim should be to create self-sufficiency and not export and, as the livestock industry develops, we think it will be necessary for a Livestock Officer to be appointed. But an absolute essential preliminary is a tsetse-fly control scheme on an inter-territorial basis, which may possibly necessitate a special organisation in Nyasaland.

With the exception of the Nkonde and the Ngoni, the tribes of Nyasaland are not pastoral inclined, and it was not until recent years that these two cattle owning tribes learned to regard their stock as serving any purpose other than that of currency.

12. It was thought that some cash return from the produce of their stock would encourage the improvement of animal husbandry with dietetic and agricultural advantages.

In 1936 private European enterprise began the manufacture of ghee, it was later taken over by the Veterinary Department and there were 7 marketing centres in existence by 1940, with a total production of 41,000 lbs. of ghee in that year. Production rose to 80,000 lbs. in 1943 and the total requirements of the Military forces in the Protectorate were met.

13. We endorse a scheme which has been formulated by the Chief Veterinary Officer in collaboration with the Directors of Medical Services and of Agriculture. In brief the scheme is as follows:—

(a) In the Northern Province: to select cows and bulls in Native herds and to treat these as herd cattle, demarcating pasture areas in which the selected cattle would be "paddocked". While "paddocked" the cattle would be under the supervision of the Chief Veterinary Officer who would be under the guidance of both the Agricultural and Veterinary Departments regarding management, breeding and feeding. In this way it is hoped to build up an improved and extended type of native cattle.

When this has been done it is proposed to concentrate ghee and butter-making at four centres in the Northern Province, i.e. two in the neighbourhood of Lilongwe, one at Dowa and one at Dedza. Thus it is hoped to bring about a cattle improvement scheme in that Province at the same time as an increase in dairy products.

(b) In the Southern Province: when the four centres in the Northern Province have been brought into being, it is proposed to start a fifth centre. In this connection we mention the desirability of providing improved stock for ordered native settlement.

(c) As regards European stock owners, we propose that the Veterinary Department should send circulars to individual stock holders, asking them what are their requirements in the matter of stock and, when this information is available, we suggest that Government should consider importing suitable animals on their behalf.

(d) In regard to stock generally we consider that every endeavour should be made to induce all owners to stall-feed their beasts in order to stop the erosion caused by indiscriminate grazing and to improve the manurial quality of the waste products.

(e) We think that when these schemes are in being that an opportunity may occur for them to be conducted through private agency on a co-partnership and profit-sharing basis with the native owners.

Other considerations which occur to us are that Government should not attempt, as yet, to give facilities for an export trade in dairy products; that Government should consider fixing guaranteed prices for those products; that in the Native stock improvement schemes outlined in sub-paragraphs (a) and (b) above, experiments with imported stock should be included; and that a pasturage survey in Nyasaland is a pre-requisite of animal husbandry schemes.

We understand that the four Northern centres to which we refer in paragraph (a) above have been selected; and we urge that the Department should expedite the schemes in view of a possible shortage in proteins, edible fats and oils.

IV. Amalgamation of the Agricultural and Veterinary Departments.

14. Both the Director of Agriculture and the Chief Veterinary Officer have told us that, in their opinion, the two departments should not be amalgamated. They consider, however, that there should be a re-apportionment of work, e.g. that the work connected with the production of ghee, the curing of hides, the establishment of native dairies and the management of livestock centres should be dealt with by the Agricultural Department. This separation of functions would leave the Veterinary Department to deal with the diagnosis and treatment and prevention of animal diseases. The Committee was given to understand that in various Colonies at various times the Agricultural and Veterinary Departments had been amalgamated and that, in some cases, subsequently they had been separated.

15. The Committee is of opinion that the Agricultural and Veterinary Departments should not be amalgamated in the full sense of that word, but that there is need for a re-alignment of the work of the two Departments as suggested by the Director of Agriculture and the Chief Veterinary Officer.

V. General.

16. Manifestly there are other matters connected with Agriculture and Animal Husbandry such as land usage, the conservation of natural resources, water supplies, irrigation, soil erosion, marketing and settlement. Some of these subjects are interdependent and we are not yet in a position to report upon them.

17. We invite reference to our Interim Report No. 2 upon Education, in which we advise that agricultural and veterinary training should be given at a Polytechnic institution which we propose in that Report.

18. In conclusion we emphasize that agriculture is the one industry upon which the economy of the country is based. It should not be assumed that the interests of the European and African farming communities are divergent; on the contrary, we are convinced that their interests are complementary.

The past agricultural history of the country shows that the European planter has initiated and developed the country's agricultural industries, and not only those in which the European is the principal but also those which are joint enterprises as well as those which are purely African in character. An instance is the dark-fired tobacco growing industry which is now largely centred in the Northern Province. This industry was started by European planters but is now operated under two systems: growing by Africans on their own account, and by tenants growing for sale to their landlords. In our opinion the further development of both these forms of producing dark-fired tobacco is possible, always provided market conditions justify its development and that the general agricultural economy of the country is adequately safeguarded. We have reason to believe that land suitable for that development exists.

It is our considered opinion that the full development of the agriculture of the country, so urgently needed for its prosperity, can only be brought about by the close co-operation, and, where possible, by the co-partnership, of the European planters and farmers with the African.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*)

G. H. ADAMS

W. TAIT-BOWIE

M. P. BARROW

H. G. DUNCAN

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(Note. Difficulties of communication prevented the Bishop of Nyasaland receiving the final draft of this report before it was necessary to print it).

HIS EXCELLENCY THE GOVERNOR OF THE
NYASALAND PROTECTORATE.

2nd August, 1944.

No. 5—COMMUNICATIONS.

YOUR EXCELLENCY:

The Post-War Development Committee beg to submit the following Interim Report upon communications in Nyasaland.

I. Railway.

The Railways serving Nyasaland are 497 miles long from the shores of Lake Nyasa to the junction with the Beira Railway (18 miles from Beira) in Portuguese East Africa. The system consists of the Nyasaland Railways running from Salima, on Lake Nyasa, to Blantyre (160 miles) and from Blantyre to Port Herald, near the Portuguese frontier (113 miles), this is the former Shire Highlands Railway; the Central African Railway from Port Herald to Sena, south of the Zambesi (including the Zambesi Bridge) (43 miles); and the Trans-Zambesi Railway from Sena to Dondo on the Beira Railway (181 miles).

The former Shire Highlands Railway, which is now part of the Nyasaland Railways, was built in 1907. The Central African Railway, as far as the North bank of the Zambesi River, was built in 1913-1915; the Trans-Zambesi Railway in 1919-22; the Zambesi Bridge and the Northern extension from Blantyre to Lake Nyasa were opened for traffic in 1935. These various Railways together form the single line track which gives Nyasaland its only outlet to the sea.

2. Nyasaland is a purely agricultural country; its only mineral deposit of importance being bauxite, the value of which has not yet been proved. The main exports are tobacco, tea and cotton, of which tobacco and tea each account for about 45% of the export trade in value, and cotton for about 5%. Tea is grown by Europeans and cotton by natives, while tobacco is grown by both.

3. When the Zambesi Bridge was built hopes were entertained for the future development of Nyasaland, but they have materialised only to a limited extent. In our view the real matter at issue is whether the elimination of the Railway debts would enable freights to be reduced. We agree that Railway operating costs are low, but, in our opinion, the rates are much too high for the country's produce and we refer to the much lower rates in Southern Rhodesia and in the dependencies North of Nyasaland.

4. The principal exports have risen from 10,000 tons in 1932 to 18,500 tons in 1942, but there was little change in the value of the country's export and import trade in the 10 years before 1939:—

	1928		1929		1938		1939
	£		£		£		£
Exports	707,000	...	625,000	...	975,000	...	824,000
Imports	906,000	...	771,000	...	885,000	...	775,000
TOTAL	£1,613,000		£1,396,000		£1,808,000		£1,599,000

5. The construction of the Railways and the Zambesi Bridge was financed to a large extent by the Nyasaland Government with money provided by His Majesty's Government. The complicated financial structure of the Railway Companies shows that 80 per cent. of the Debentures and the majority, for voting purposes, of the Ordinary shares in the Nyasaland Railways are held by the Nyasaland Government; and that the Debentures and Ordinary shares of the Central African Railway are all held by the Nyasaland Railways. In the case of the Trans-Zambesi Railway, the Nyasaland Government holds a quarter of the Ordinary shares and the interest on all the Debentures which are not held either by the Government or by Nyasaland Railways is covered by a guarantee from the Government. This guarantee will expire in 1945 and, in the Committee's opinion, it is a matter for consideration whether the whole of the Company's debt held by the public, the greater part of which is in the form of 6 per cent. Debentures, should be redeemed and other Debentures be issued to Government at a lower rate of interest to cover the transaction.

It is also a matter for consideration whether the 5 per cent. Debentures of Nyasaland Railways held by the public should be redeemed and Debentures at a lower rate of interest be issued to Government instead. In this fashion the whole debt of all the Railways would be held by the Nyasaland Government.

6. The annual interest charges payable by the Companies are heavy in comparison with the operating profits. In 1942, the total charges payable were approximately £300,000, of which £250,000 was payable to Government, or guaranteed by Government; whereas the excess of operating receipts over working expenses, including provision for renewals, was only £200,000. The various Railway Companies were able to meet the charges to the extent of £142,000 of which £50,000 represented the interest and redemption of Debentures held by the public with no guarantee, and the remaining £92,000 went to reduce interest payments which would otherwise have had to be made by His Majesty's Government. The amount of assistance provided by His Majesty's Government in 1942 was £185,000. At the end of 1942 the Trans-Zambesi Railway Company owed £2,396,000 to Government in respect of advances under the guarantee, of which £875,000 represented accrued interest, and the Nyasaland Railways owed Government £446,000 which represented accumulated short-falls on interest and sinking fund on the Debentures held by Government.

7. The management of the Railways is recognised to be efficient, but, with an exceptionally heavy burden of debt and a complete inability to meet the annual charges without recourse to the

Government guarantee, freight rates have been kept high and development has been retarded, particularly where Africans are concerned. Thus the Nyasaland producers are at a disadvantage in comparison with those in neighbouring territories. Comparative examples of the Nyasaland rates for the same haul with those in neighbouring territories are:—

	Miles	Nyasaland Railways			Miles	Rhodesia Railways			Miles	Kenya/Uganda Railways			Miles	Tanganyika Railways		
		£	s.	d.		£	s.	d.		£	s.	d.		£	s.	d.
Tobacco	545	11	1	1	562	2	0	9	464	2	9	7	—	—	—	—
Tea ...	515	7	2	0	562	3	1	2	464	2	9	7	562	2	4	0
Cotton	515	5	5	0	562	1	15	11	648	3	1	7	562	3	18	0

As regards Imports the following are examples:

	Miles	Nyasaland Railways			Miles	Rhodesia Railways			Miles	Kenya/Uganda Railways			Miles	Tanganyika Railways		
		£	s.	d.		£	s.	d.		£	s.	d.		£	s.	d.
Cement	515	5	18	0	562	4	11	6	562	2	5	2	562	2	13	7
Cotton goods	515	21	1	8	562	16	13	4	562	13	16	8	562	17	14	7

(Note). It is understood that the Nyasaland Railways Limited count the distance from Salima on Lake Nyasa to the port of Beira in Portuguese East Africa as 562 miles, although the actual distance is 515 miles. The difference of 47 miles is accounted for by accounting the 3 miles haulage over the Zambesi River Bridge and its southern approach as a 50 miles haul for rate fixing purposes. Thus:—

Salima to Beira	...	515 Miles
Approach haul of 50 miles minus 3 miles length of bridge and approaches	...	47 "
		<u>562</u> "

8. In the preceding paragraph we have mentioned the effect of high railway rates upon African development which is not without its effect upon the large scale temporary emigration of Nyasaland natives southwards.

At the time of writing, including natives on war service, some 40% of the total able-bodied males are out of the country. It is estimated that to-day there are some 105,000 adult male natives of Nyasaland either in the Union of South Africa, or in Southern or Northern Rhodesia out of an estimated (1942) total population of 2,140,000. The effect of this large scale emigration must be to slow down the economic life of the country and have an adverse effect upon the standard of living in Nyasaland.

These factors, high freight (and road transport) rates and emigration, combine to make the picture of native life in Nyasaland anything but pleasant.

9. It is to be noted that freight rates are fixed by the Boards of the Railway Companies in London. Suggestions to the General Manager can be made by the Nyasaland Government, but there is no recognised procedure for local consideration of freight rates. This, we remark, is open to much criticism.

10. In these circumstances, while the Committee realises that the high Railway rates in Nyasaland are largely due to heavy debts and small freights, it is impressed by the urgent need for an improvement in the standard of living and the purchasing power of the African and for cheaper railway and other transport rates to encourage production and the development of the country.

The Committee realises that it can do no more than present the problem: it is not one capable of solution in Nyasaland and upon the answer much depends.

II. The Co-ordination of Commercial Motor Transport and the Development of Road and Rail Facilities.

11. The Committee agree that there is no co-ordination between motor transport companies in the country and that it has proved impossible to get those interests to rationalise either their vehicles, or their methods of working. The position is illustrated by the fact that the cost of operating 10 vehicles of the Mechanical Transport Department in 1942, the vehicles ranging in age from 10 to 1 year, was, at 82% loading, including all overhead charges, 5.74d. per short ton mile and the charges levied by commercial transporters for transporting e.g. tobacco in 1942-3 were a maximum of 8d. per short ton mile and in 1944 were increased to 9.6d. per short ton mile.

We have good reason to believe that Diesel units of large carrying capacity can be operated economically at rates lower than those given above, in which petrol driven lorries are included.

In these circumstances the Committee advise:—

(1) That there is a primary need for the co-ordination, control and development of road transport in Nyasaland; and that a Transport Board, including Unofficial members, should be set up which would undertake the co-ordination, control and development of both rail and road transport.

It was further agreed that this was preferable to the establishment of a separate public utility company for motor transport.

(2) That there is an urgent need to develop passenger road traffic, particularly to the railway stations, and that steps should be taken to inaugurate controlled omnibus services, catering for all sections of the community, from and to the main centres of the Protectorate.

(3) That Government should open early negotiations with neighbouring territories as to the future of the Great North Road and other inter-territorial roads.

(4) That all possible means of obtaining reductions in the high price of fuel oils, as compared with that ruling in neighbouring countries, should be explored, e.g. by providing bulk storage.

III. Establishment of Area and Provincial Road Boards.

12. The Committee advise:—

(1) That the Transport Board proposed in connection with road and rail development should also be the Road Board of the Protectorate and that District Road Boards should be revived with a membership retiring by rotation annually.

(2) That District Road Boards should consist of an Officer of the Public Works Department nominated by the Director as Chairman, the District Commissioner concerned, and three unofficial members. It was thought that these Boards could be either advisory or operative, as desired by Government. No need was seen to await the post-war period before reviving District Road Boards.

We have agreed with the classification of the roads which is printed in the Supplement of the *Gazette* of the 14th February, 1940, and of which we attach a copy in Appendix I to this Report.

We are of opinion that, to enable cheap transport, the maximum permissible load on Class I roads should be raised from 8 to 20 tons as soon as is possible; we appreciate that this will necessitate considerable expenditure on the present roads and bridges.

We propose the following schedule of roads for treatment with tarmac, as funds permit:—

Order of priority	Name of road	Mileage	Cost with bitumen and plant at pre-war prices	Cost with bitumen and plant at latest war-time prices
1.	Salima-Lilongwe-Mbabzi corner ...	76	£88,600	£144,000
	Limbe-Cholo-Luchenza-Mlanje-Portuguese East Africa border ...	62	£55,800	£111,600
	Blantyre-Chileka Airport ...	12	£13,200	£24,000
	Limbe-Zomba-Palombe Road Turn-off ...	40	£36,600	£72,000
2.	Lilongwe-Lombadzi-Mponela ...	39	£42,900	£78,000
3.	Lilongwe-Lombadzi-Mponela ...	39	£42,900	£78,000
4.	Limbe-Fundi's Cross-Palombe ...	47	£51,700	£95,000
		276	£283,800	£525,200
	Plant: Rollers, Stone Crushers, Sprayers, etc. ...	say	£16,200	£32,800
			<u>£300,000</u>	<u>£558,000</u>

IV. Development of Lake Facilities.

13. The Committee understand that the General Manager of the Nyasaland Railways has visited Dar-es-Salaam for consultation with the General Manager of the Tanganyika Railways and the Committee advise, subject to an examination of agreements between Government and the Railway, that the following works should be done as soon as possible:—

Kota Kota—lengthening of the jetty and erection of a small shed.
 Nkata Bay—erection of a pier and storage shed and construction of a short length of motor road.
 Florence Bay—provision of a small shed at south end of Bay for landing goods and passengers by boat.
 Ngara—construction of a jetty for landing and loading goods and passengers by boat and by lighter.

We consider, having regard to the rise and fall of Lake Nyasa, that facilities for pile-driving should be provided at Kota Kota, Nkata Bay and Ngara. It may be possible to supply the need by one pile-driver mounted on a barge.

V. Development of Telegraph, Telephone and Broadcasting Facilities.

14. The Committee advise as follows:—

(1) BUILDINGS.

That 36 new Post Offices of varying size and housing for the staff at the respective costs of £20,000 and £21,000 should be constructed as and when funds permit.

It was also agreed that the experiment of Mobile Post Offices should be made and that the initiation of an experiment with one van should not wait until the post-war period.

(2) MAIL SERVICES.

That all extra-territorial first class mail matter would probably be conveyed by air after the war and that the main clearing house for these mails would be at Chileka where all the sorting would be done. It is not possible at the present stage of Empire airmail development to estimate the additional cost occasioned by extra-territorial airmails.

As regards internal mails, the Committee refer to its recommendation that omnibus services should be inaugurated as soon as possible in the country and is of opinion that each omnibus should include a Royal Mail compartment.

(3) TELEGRAPHS.

(a) That the present Zomba-Liwonde line on iron telegraph poles should be extended to Lilongwe via Ncheu and Dedza, but until iron poles are available it should be reconstructed in wood; and that provision should also be made for the line to carry a telephone. The estimated cost is £21,000. The Committee consider that this work is of low priority.

(b) That by the use of machine telegraphy the output of work could be increased by as much as 100% and that 10 teleprinters, at an approximate cost of £800, should be obtained for the purpose.

(c) That as an immediate item, the possibility of using the Nyasaland Railways land telegraph line between Blantyre and Salima should be investigated.

(4) WIRELESS.

The Committee understood from the Postmaster General that one short wave instrument was installed at Chileka, that a second short wave instrument for Chileka was on the way, and that with the installation of both instruments Chileka would be able to deal with all aviation and commercial traffic. The Committee agree that, with the development of air services, wireless stations would probably be necessary at Lilongwe and Karonga, and that stations would also be necessary at Njakwa and Kasungu. The expenditure on these installations is estimated at £5,000.

(5) TELEPHONES.

(a) *Rural Telephones.* The Committee noted that rural party line systems in the Cholo, Mlanje, Limbe and Zomba areas are now in the course of development, and that considerable difficulty has been experienced in inducing probable subscribers to subscribe to the party line system.

(b) *Extra-Territorial Telephones.* The Committee was informed it was probable that in the near future the Portuguese authorities would develop telephone communications as far north as Dona Anna, on the North bank of the Zambesi River bridge, and that this would probably be connected up with the Southern Rhodesia system and thus with the Union of South Africa and Northern Rhodesia.

Because of Nyasaland's interests with Beira and with Salisbury, it seemed desirable to the Committee that telephonic connection with those two places should be made. The estimate for a two-copperwire circuit from Blantyre to Border Siding, 16 miles south of Port Herald, to connect with the Portuguese system is estimated at £15,000 and this expenditure the Committee suggest is suitable for an application under the Colonial Development and Welfare Act.

(c) *Automatic Telephones.* In view of constant technical difficulties, and the small number of the telephone-using population, the Committee did not recommend that automatic exchanges at Limbe, Blantyre and Zomba should be installed.

(6) BROADCASTING.

The Postmaster-General considers that broadcasting is not a matter which comes within the scope of the Posts and Telegraphs Department, but he agrees that technical inspection and supervision was work which could best be done by the staff of his Department.

The Committee consider that a broadcasting station is necessary in Nyasaland and that a probable site was in the vicinity of the aerodrome at Zomba, the estimated cost is £8,000. The Committee is of the opinion that wireless receiving sets, parts and batteries should be supplied by Government to native centres, on repayment, and that Government should be responsible for loud speaking apparatus.

(7) TRAINING SCHOOL.

The Committee endorsed the Postmaster General's recommendation that a Training School for Native Postal Clerks, Telegraphists, Linesmen, etc., should be inaugurated; and is of opinion that this school should be included in the Industrial Training Depot, or Polytechnic, which formed one of the Committee's main recommendations when considering the education of the country.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*)

G. H. ADAMS

W. TAIT BOWIE

M. P. BARROW

H. G. DUNCAN

A. F. BARRON

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(Note. Difficulties of communication prevented the Bishop of Nyasaland receiving the final draft of this Report before it was necessary to print it).

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

2nd August, 1944.

APPENDIX I.

CLASSIFICATION OF ROADS AND MAXIMUM GROSS WEIGHT ALLOWED ON EACH CLASS OF ROAD.

CLASS I.	PAVED SURFACE.	PERMISSIBLE GROSS WEIGHTS.
(a) Full Width	...	8 Tons throughout the year.
(b) Strips	...	
CLASS II.	IMPROVED SURFACE.	8 Tons throughout the year.
(a) Water-bound Macadam	...	
(b) Gravel, Laterite, etc.	...	
CLASS III.	NATURAL SURFACE.	
(a) All-weather	...	5 Tons, June to December inclusive.
(b) Seasonal—Heavy Traffic	...	2 Tons, December to May
(c) Seasonal—Light Traffic	...	2 Tons, throughout the year.
CLASS IV.	NATURAL SURFACE.	
(a) Seasonal—Light Traffic	...	2 Tons, June to November inclusive.
(b) Seasonal—Tracks	...	1½ " only December to June inclusive.
		1½ " in dry weather.

DESIGNATION.	CLASS AND MILEAGE.					
	Class I.		Class II.		Class III.	
	(a) Miles.	(b) Miles.	(a) Miles.	(b) Miles.	(a) Miles.	(b) Miles.
A. MAIN ROADS.						
Blantyre-Zomba (including Limbe branch)	1	1½	37			
Limbe-Cholo-Luchenza			32			
Luchenza-Mlanje-Ruo-Portuguese Border			30		1	
Limbe-Midima-Mlanje (junction Luchenza Road) with branch to Mikalongwe Railway Station						34
Blantyre-Matope-Ncheu (junction Liwonde-Ncheu Road)				7	77	
Blantyre (junction Matope Road)-Mwanza-Portuguese Border (Salisbury Road)					51	
Blantyre-Chikwawa						
Chikwawa-Chiromo						
Cholo-Chiromo-Port Herald			12			
Zomba-Palombe-Fort Lister						16
Palombe-Mlanje (junction Midima Road)						21
Zomba-Liwonde (To Ferry)			1½		32	
Liwonde (Ferry)-Fort Johnston					47	
Fort Johnston-Namwera						24
Namwera-Kawinga-Likwenu (mile 16 Zomba-Liwonde Road)						82
Fort Johnston-Balaka (junction Liwonde-Ncheu Road)						52
Balaka-Rivi rivi (junction Blantyre-Ncheu Road)						3
Balaka Station-Nkazi (junction Liwonde-Fort Johnston Road)						18
Liwonde (junction Fort Johnston Road)-Ncheu-Dedza-Lilongwe					152	
Lilongwe-Fort Manning-N. Rhodesian Border (Fort Jameson and Lusaka Road)					78	
Lilongwe (junction Kasungu Road)-Salima and Lombadzi Short Cut					67	

DESIGNATION	CLASS AND MILEAGE						
	Class I.		Class II.		Class III.		
	(a) Miles.	(b) Miles.	(a) Miles.	(b) Miles.	(a) Miles.	(b) Miles.	(c) Miles.
Ililongwe (junction Kasungu Road)-Dowa-Salima Road junction					22		
Dowa-Mbobo-Kota Kota							85
Ililongwe-Kasungu-Lodjwa					134		
Kasungu-Mbobo							42
Lodjwa-Mzimba-Ezondweni-Njakwa					139		
Ezondweni-Ekwendeni-Nkata Bay						63	
Njakwa-Livingstonia					44		
Livingstonia-Karonga							75
Njakwa-Katumbi-Fort Hill-Tunduma (Tanganyika and N. Rhodesia Borders)						178	
Total	4	1½	112½	7	850	521	356

DESIGNATION	CLASS AND MILEAGE						
	Class I.		Class II.		Class III.		
	(a)	(b)	(a)	(b)	(a)	(b)	(c)
B. PRINCIPAL DISTRICT ROADS.							
Chikadza-Nkate-Makwira-Chiromo							50
Konjeni Road, Cholo						14	
Anderdale-Mitambi-Mimosa						17	
Mountain Road, Mlanje (Short cut to Palombe)						7	
Vankulamadzi-Neno							28
Blantyre Zomba, Old Road							6
Chiradzulu Bye-pass, Blantyre end (Zedi)						10	
Chiradzulu Bye-pass, Zomba road (Namadidi)							8
Zomba Mountain Road							6
Palombe Road, Mile 4-Lake Shirwa							15
Siwonde Junction, Likwenu-Kawinga Road							16
Fort Johnston-Monkey Bay							42½
Bedza-Mponzi-Lintipe Valley					30		
Mlanda-Mlangeni Low Road						12	
Nkata Bay-Chinteche							25
Katumbi junction, Mzimba Road							46
Indi-Mbadzi-Dzenza (with branch to Fort Manning Road)						43	
Isipe-Belila						7	
Salima Road-Chitala						11	
Arrington-Belila-Ntakataka-Salima							88
Salima Maganga						12	
Idima Hill-Mlomba Hill-Palombe						27	
Chonde-Chikuli-Tuchila						6	
Mlomba-Namadidi-Nankumba							9
Ntakataka-Bawi						4	
Total					90	170	339½

Designation.	Class IV (a) Mileage	Class IV (b) Mileage	Class IV (a) Mileage	Class IV (b) Mileage
	Usable by 2 ton vehicles in dry season.	Usable by 1½ ton vehicles in dry weather.	Usable by 2 ton vehicles in dry season.	Usable by 1½ ton vehicles in dry weather.
C. OTHER DISTRICT ROADS.—(Ctd.)				
1. Lower Shire (Port Herald).				
Port Herald-Ndamera	...	...	...	...
" " Nachikadza	...	...	...	...
Chromo-Lalanje	...	12	...	...
Ruo-Lulwe	...	8	...	...
Mkuziwaduko-Makoko	...	3	...	...
Total	43	12	...	...
2. Chikweawa.				
Chikwawa-Belen	...	28	...	...
" " Ngabu	...	37	...	...
Total	...	65	...	...
3. Cholo.				
Cholo-Nasonia-Mikalongwe	...	...	20	...
Cholo Main Road (mile 9)-Nsanje-Mikalongwe	...	...	8	...
Mwalanduzi-Mikombe-Luchenza	...	...	18	...
Cholo Main Road (mile 12)-Hanbury-Ngulula-Makandi Siding	...	...	25	...
Makandi Siding-Ndata-Mikalongwe	...	...	8	...
Cholo Main Road (mile 16)-Naningomba-Cholo Mountain	...	...	10	...
Cholo Main Road (mile 7)-Makungwa	...	...	6	...
Cholo Main Road (mile 13)-Makala-Nkami	...	...	9	...
Total	104	...	...	...
4. Mlanje.				
Palombe-Nambazo	...	28	...	...
Total	...	28	...	...
5. Blantyre.				
Blantyre-Michiru	...	...	17	...
Matope-Lisungwe	...	...	15	...
Neno-Matandani	...	...	...	...
Blantyre-Mitsidi	...	...	8	...
Total	...	...	3	...
6. Chiradzulu.				
Chiradzulu-Mombezi-Mbombwe-Nguludi-Midima-	...	...	...	...
" " Nsoni	...	...	...	...
Total	...	...	...	...
7. Zomba.				
Zomba-Namiwawa	...	...	...	...
Blantyre Road (mile 7)-Amika-N. Naiwali-Blantyre Road (mile 9)	...	...	...	...
Palombe Road (mile 14)-Kimu	...	...	...	...
Total	...	...	...	...
8. Upper Shire (Liwonde).				
Liwawadzi-Bazale	...	...	...	...
Liwawadzi-Utale-Pimbi	...	...	...	...
Ulongwe-Chinyaka	...	...	...	...
Namwera Road-Kawinga	...	...	...	...
" " Chikwewo	...	...	...	...
" " Nyambi	...	...	...	...
Likwenu-Chamba	...	...	...	...
Total	...	...	...	...

C. OTHER DISTRICT ROADS (Contd.)

9. South Nyasa (Fort Johnston).

Karonga-Monkey Bay turning
 Namwera-Luwatika
 Malindi-Fort Maguire (to mile 15 from latter)
 Nsafil-Makoli

Total

10. Ntchen.

Dombale-Kansapato
 Biriwiri-Nzama-Muso
 Gowa-Muluma
 Matale-Seuzani
 Dzunje-Kansapato-Kandeu
 Manjawila-Matale

Total

11. Dedza.

Lilongwe Road mile 27-Kasina Lintipe Drift
 Lintipe-Valley Road-Nsunduzi-Tete
 Mphunzi-Mphati
 Ncheu Road, mile 6-Bembeke-Nkandabwako
 Lintipe Bridge Mayani North Road-Mkhoma Drift via Kasina
 Mpatamilonde-Mayani
 Mayani-Mkhoma drift on above route
 Dedza-Msitolengwe
 Tete-Lintipe Bridge
 Tete-Chamangwana
 Junction Mphunzi-Mpati Road-Kachere-Tete

Total

C. OTHER DISTRICT ROADS (Contd.)

12. Lilongwe.

Chiwesa (Dedza Road, mile 5)-Chakudewa-Chadza-Ngoti
 Dedza Road, mile 22-Mkhoma
 Lilongwe-Likuni-Malingunde
 Fort Manning Road, mile 24-Kalolo-Vizimba
 Dowa Road, Mile 9-Dzenza
 Chatendewa-Chiseka-Bunda-Mitundu
 Likuni-Kachawa
 Likuni-Fort Manning Road
 Kachawa Mile 20, Fort Manning Road
 Vizimba-Mudi-Chipwanga-Bua
 Vizimba-Chippala-Chiweta-Muwanga

Total

13. Fort Manning.

Fort Manning-Mebini-Mkanda
 " " -Mponda-Sante
 Gwaligwali-Mtunga Ferry

Total

14. Dora.

Lombadzi River-Mkhoma-Lintipe Drift
 Mathumba Cross roads-Salima Road
 " " -Benga
 " " -Makanjila
 Majiga-Nambuma
 Dowa-Kongwe
 Majiga-Dowa road, short cut
 Maganga-Senga Hills

Total

Designation	Class IV (a) Mileage	Class IV (b) Mileage
	Usable by 2 ton vehicles in dry season	Usable by 1½ ton vehicles in dry weather
12. Lilongwe.		
Chiwesa (Dedza Road, mile 5)-Chakudewa-Chadza-Ngoti	12	12
Dedza Road, mile 22-Mkhoma	10	10
Lilongwe-Likuni-Malingunde	20	20
Fort Manning Road, mile 24-Kalolo-Vizimba	25	25
Dowa Road, Mile 9-Dzenza	4	4
Chatendewa-Chiseka-Bunda-Mitundu	28	28
Likuni-Kachawa	14	14
Likuni-Fort Manning Road	4	4
Kachawa Mile 20, Fort Manning Road	15	15
Vizimba-Mudi-Chipwanga-Bua	18	18
Vizimba-Chippala-Chiweta-Muwanga	6	6
Total	156	
13. Fort Manning.		
Fort Manning-Mebini-Mkanda	21	48
" " -Mponda-Sante		20
Gwaligwali-Mtunga Ferry		68
Total	21	
14. Dora.		
Lombadzi River-Mkhoma-Lintipe Drift	22	
Mathumba Cross roads-Salima Road	10	
" " -Benga	20	
" " -Makanjila	12	
Majiga-Nambuma	30	
Dowa-Kongwe	8	
Majiga-Dowa road, short cut	5	
Maganga-Senga Hills	14	
Total	116	

Designation	Class IV (a) Mileage	Class IV (b) Mileage
	Usable by 2 ton vehicles in dry season	Usable by 1½ ton vehicles in dry weather
9. South Nyasa (Fort Johnston).		
Karonga-Monkey Bay turning	5	5
Namwera-Luwatika	8	8
Malindi-Fort Maguire (to mile 15 from latter)	51	51
Nsafil-Makoli	4	4
Total	75	
10. Ntchen.		
Dombale-Kansapato	7	10
Biriwiri-Nzama-Muso	9	10
Gowa-Muluma		7
Matale-Seuzani	25	
Dzunje-Kansapato-Kandeu	6	
Manjawila-Matale		
Total	22	52
11. Dedza.		
Lilongwe Road mile 27-Kasina Lintipe Drift	9	7
Lintipe-Valley Road-Nsunduzi-Tete	12	15
Mphunzi-Mphati	9	10
Ncheu Road, mile 6-Bembeke-Nkandabwako	8	18
Lintipe Bridge Mayani North Road-Mkhoma Drift via Kasina		
Mpatamilonde-Mayani		
Mayani-Mkhoma drift on above route		
Dedza-Msitolengwe		
Tete-Lintipe Bridge	10	
Tete-Chamangwana	13	
Junction Mphunzi-Mpati Road-Kachere-Tete	10	
Total	71	50

Designation	Class IV (a) Mileage	Class IV (b) Mileage
C. OTHER DISTRICT ROADS (Contd.)		
15. Kasungu.		
Mzimba Road, mile 32-Chisempere-Emfeni	8	25
Mkako-Misesa-Chamana	...	12
"Papyela	...	25
Kaluhuna-N. Rhodesian Border	...	15
Bua Bridge-Rusa Junction	...	22
Kasungu-Malepera	...	99
Total	8	99
16. Kota Kota.		
Chenji Hill turning-Chintembwe-Nehisi	10	8
Main Road to N.A. Jere	2	30
Nehisi via N.A. Kasakula to Mwansambo	3	19
"N.A. Benga	...	12
"N.A. Kaluno	...	69
Kota Kota-Sani Chia	...	...
"Bua-Lake Shore	...	...
Total	15	69
17. Mombetas (Mzimba).		
Kasungu Road, mile 15 Loudon	19	70
" " " " " " " " " "	15	15
Loudon-Edingeni (N. Rhodesian Border Chasefu Road)	15	17
Hewe Road, mile 61-Pickford Jere-Lake Kazuni	16	12
" " " " " " " " " "	4	...
Ekwendeni Road, mile 43-Chindi Jere	...	...
" " " " " " " " " "	...	...
Kasungu Road, mile 34-Hobo	...	...
18. West Nyasa (Chinteche).		
Chinteche-Bandawe-Chituka	...	9
Total	...	9
19. North Nyasa (Karonga).		
Karonga-Mpata	...	10
Uliwa-Deep Bay	...	8
Karonga-Ngerenge	...	18
Fort Hill-Nyondo	...	14
Total	...	40
Total All Districts	837	616

No. 6—FORESTRY.

YOUR EXCELLENCY:

The Post-War Development Committee beg to submit the following Interim Report upon Forestry in Nyasaland.

I. General.

We understand that approximately 9.05 per cent. of the total land area of the Protectorate is now contained in forest reserves, demarcated village forests, closed hill slopes, and the protected banks of streams. Other woodlands, in waterless and unoccupied country and on private estates, are estimated to be about 7 to 8 per cent. of the total land area and, in addition, there are large areas of low regrowth on lands subject to periodical agriculture. We believe the latest comparable figures for Kenya, Tanganyika and Uganda are respectively 3.58%, 1.5% and 7.6%.

2. We take it that the aim of Forestry policy is to assist in and to stimulate the provision of adequate supplies of all classes of forest produce required by the natives in the country, also to preserve the cover of forest, or of natural vegetation, in catchment areas and on lands which are particularly liable to erosion or to desiccation. We consider that production and protection can, generally speaking, go hand in hand, and that existing forest reservations in Nyasaland fit in with planning for the dedication of land to its most suitable use. By far the greater part of the reservations have been made in the interests of water supply, soil and climate.

3. With the foregoing statement in mind we have come to the following main conclusions:—

(a) the development of an export trade in timber is out of the question;

(b) the requirements of wood by the non-native population are insignificant compared with the requirements of the native population. Moreover, a comparatively high-quality product is required by non-natives and any increase in demand over and above that which can be produced by the European agricultural community itself can best be met by concentrated planting as near as possible to the local markets;

(c) the great bulk of the requirements of the native population is for short poles for constructional purposes. At present saw-timber is comparatively scarce and beyond the means of many natives. (We consider that there is a large scope for meeting the coming needs of natives e.g. by promoting community planting schemes, by improving demarcated natural forests, by adopting preservative treatment of non-durable timbers and by stimulating the native sawing industry);

(d) Government should delegate to approved Native Authorities the control and management of forests and woodlands in their areas, in which they should be assisted by the Forestry Department;

(e) measures of rural conservation, apart from the protection and management of demarcated forests, the continuation of which we advocate are:

i. the protection of stream banks;

ii. the protection of specified steep hill-sides;

iii. the preservation of certain trees which are protected by Schedules under the Forest Ordinance;

iv. the control of trees used for the making of canoes.

4. Complementary to our main conclusions are:

i. research and experimental work by the Forestry Department;

ii. encouragement of the most economical use of timber and of other forest products;

iii. ensuring that afforestation covenants are carried out by lessees from Government;

iv. co-operation with the Administration and with technical departments in schemes of rural planning and development.

5. In our view the main problems are to meet the growing need for durable saw timber, instead of poles, by the native population as it advances towards better housing and a better standard of living, and how best to promote rural conservation and development in schemes for proper land usage.

The forests are mainly woodland and savanna types rather than closed forests and the majority are composed of small trees, of which only a few species provide durable timber. To a large extent the poor quality of the woodlands is due to the long dry season, but such factors as periodic fires and soil erosion due to shifting cultivation have played a part. Woodland and isolated trees are rapidly being removed from Native Trust Lands to make way for agriculture and for pasturage. Consequently demarcated forests are now increasingly relied upon to provide the demands of the native population.

6. We have mentioned some types of land which, in rural conservation, are particularly suited for sylvan development. Experience has shown that to prevent the ruthless destruction of forests and of natural vegetation on such vital areas reservations and closure are essential; and we advocate an early review of the present position.

To meet the native need for saw timber it is clear that the extensive method of improving natural woodlands, by natural regeneration with simple schemes of management, will have to be supplemented by planting schemes. This, we are informed, has proved the most economical method where the non-native market is concerned, always provided that the plantations are near the market. We therefore advocate that the intensive method of plantations and the extensive method of improving natural woodlands should both be developed in demarcated lands kept for sylvan development. The protected strips along stream banks are particularly suitable for development to increase saw timber production because of four main advantages: protection of water supply, suitable soil, a well-distributed production, the tapping of many different areas for labour.

7. It is clear also that forestry must always be closely connected with native administration and that there must be co-operation between the Administrative staff, the Native Authorities and the Forestry Department. The recent Forest Ordinance of 1942 contains comprehensive provision for delegating the control and management of Forests to Native Authorities. There are 64 Forest Reserves already constituted, or about to be constituted, and of these only 12 are under intensive management. The management of the remaining 52, which have been constituted primarily for protection, is in a rudimentary stage and we see no reason why the management of the majority of them should not be handed over to the Native Authorities concerned at an early date, provided that adequate supervision by the Administration and the Forestry Department is given.

II. Organisation and Control.

8. The Forestry Department is to-day organised into three divisions, one of which is in charge of the Conservator of Forests. The staff of Colonial Forest Service appointments consists of 4 officers, which allows for a relief for leave absences. We are of opinion that until Forestry has reached a comparatively advanced stage in Nyasaland that this staff of 4 professional officers is adequate.

9. As regards "Native Forestry" each district is provided with a District Native Forester and 5 or 6 Forest Guards, all of whom work directly under the District Commissioners. In a few cases the district forestry staffs have been supplemented recently by forest guards employed by Native Authorities. The Divisional Forest Officer keeps in contact with these men and he holds an annual revisional course for the Foresters and a few selected Guards. The main duties of the District Forestry staffs are the protection and rudimentary management of forest reserves, assisting Village Headmen in the selection of village forest areas, patrolling, controlling forest licences and assisting in general silvicultural work.

It is in this field of "Native Forestry" that we hope that development will be rapid. Responsibility for protective and patrol work might suitably be delegated to Native Authorities as soon as possible, provided the guidance of the Forestry Department is given.

10. A more intensive management of the demarcated forests, including planting and utilisation schemes will demand a larger technically trained native staff. Some training on a small scale has been given in the past by an apprenticeship system, and by annual revisional courses. Here we refer to Paragraphs 3 and 50 of our Interim Report No. 2 upon Education, in which we advocate the establishment of a Polytechnic at which Forestry and other native staffs would be trained.

11. We have examined the capital and recurrent estimates furnished by the Conservator of Forests for a Forestry School, but we emphasize our conviction that training of this nature should not be given in separate departmental institutions, but at one centre. The estimates for a Forestry School furnished by the Conservator show £1,400 capital and £1,300 recurrent costs: we refrain from using these estimates inasmuch as an amount of these two sums would, in our opinion, be common expenditure at an institution of the type which we have recommended.

12. We have stated that we think that the staff of four professionally qualified Forestry Officers is sufficient, we are of opinion that five European Foresters will be necessary including the two existing posts. One will be needed at the Polytechnic to teach forestry, three to assist the officers in charge of the three Forestry Divisions and a fifth as the relief.

13. Subsequently, in our opinion, the organisation of the Department would include Africans trained at the Polytechnic who would be termed Forest Rangers (two years course) and working under them would be Forest Supervisors (one year course). The term Forest Guards would, in future, apply only to men employed on purely protective and patrol work. We consider that it should be possible in the not distant future to train Africans to the standard of Forester with a view to replacing Europeans. As the delegation to the Native Authorities of technical work proceeds, so will trained staff have to be lent or transferred to them according to circumstances. We envisage a time when the various Native Authorities will employ staff *pari passu* with the Forestry Department. Candidates for the post of Forest Ranger would normally be selected from the Forest Supervisors after the completion of a year's course, but promotion from one class to the other would also be made on merit, in the field. A Forest Guard would not be eligible to become a Supervisor or Ranger unless he had passed through the Polytechnic.

III. Finance.

14. A rigid economy has prevailed in financing the Forestry Department for many years. The handing over to Native Authorities of non-technical duties, such as rural conservation and the rudimentary management of certain Forest Reserves is, in fact, a transfer of certain present services and the central government is thereby relieved of the expenditure on Forest Guards and on simple operations in the more remote forest areas. Consequently an apportionment of forest revenue is involved and the principle of paying a percentage of that revenue into the Native Treasuries has been approved and is covered by Section 6 of the recent Forest Ordinance.

It will be realised that the provision of saw-timber for the community is recognised as a duty of the State as in all cases it involves a long term policy which private enterprise can hardly contemplate. The Ten Year Plan which we outline below assumes that this duty will be undertaken by the Government in so far as supplies to non-natives are concerned, but it will be noticed that we propose, in principle, that the production and marketing of saw timber for native needs will be undertaken by Native Authorities and be financed through their Treasuries. Obviously there will be risks, but we draw attention to the assistance possible from the newly established Native Settlement and Welfare Fund.

15. Exclusive of Departmental issues of timber, the Forest Revenue from Native Trust Lands in the last 5 years has been approximately:—

1939—£3,292	or 63% of total Forest revenue.
1940—£2,174	.. 59%
1941—£2,910	.. 57%
1942—£3,593	.. 67%
1943—£4,145	.. 70%

The present position regarding payments to the Treasuries of Native Authorities from Protectorate revenue is that £800 for the year 1944 has been provided in the expenditure Estimates.

IV. A Ten Year Plan.

16. In the conditions of Nyasaland, intensive forestry for the production of saw timber has, we are advised, the best chance of success on evergreen sites. It is also, in our opinion, the soundest from the economic point of view. There are, as we have indicated above, three main methods of planning: the protection of tree growth; the planting of valuable indigenous species where no natural crop remains and where conditions are favourable; the concentrated planting of exotic species. In many instances a combination of the first two methods will be necessary and particularly along stream-banks, which are the natural homes of some of the best and most popular indigenous species.

17. It will be necessary, too, to do intensive work on sites less favourable than those which in nature carry evergreen vegetation, because a comprehensive plan must embrace all populated areas and be as near as possible to markets. Examples of this are the planting of pines in large units on a variety of soil types and the planting of avenues of trees along road-sides, along tracks and in the villages themselves. Wind breaks and shelter belts of trees are often essential in the interest of agriculture.

18. We have agreed with the Conservator of Forests in taking as our objective for Native Forestry the bringing under intensive management of 16,500 acres within 10 years. We wish to make it clear that we do not consider that any set percentage of land should be devoted to forestry in any particular area; or throughout the Protectorate. We reiterate that for reasons of rural conservation and in order to produce saw timber for the future needs of the African rural population a great proportion of that land which is unsuitable for human habitation by reason of its configuration, or by reason of the fact that it is on the margin of economic cultivation, should be set aside for the preservation of natural vegetation or a suitable equivalent; and we refer to what we have said on the protection of stream banks in paragraphs 3 (c) and 6 above. It will be deduced from what we have said that the 16,500 acre objective cannot be spread equally over the areas of the various Native Authorities.

Generally, we consider that the aim should be to deal with an aggregate of 5,500 acres in the first 5 years and with 11,000 acres in the second 5 years. We agree that, while extra European supervision will be necessary in the initial stages, the policy should be to train Africans to take the place of those Europeans in this type of work.

19. As regards the production of saw timber for European and industrial needs, the Department's current programme allows an annual addition of 105 acres and we propose that this should be raised to 150 acres a year, involving operations at five different centres.

Should, however, a bauxite industry begin on Mlanje Mountain, it will, we assume, prove advisable for a largely increased planting programme to be undertaken there. Annual planting at Mlanje has averaged about 25 acres, but it is confined to areas of *Widdringtonia*, the natural forest, which have been felled during the preceding year. It would, we think, be wise to make a modest start, which is included in the 150 acres mentioned above, with fast growing pines on the outer slopes of the mountain and if a bauxite industry does not begin we think that there should be no difficulty in finding a local market for this saw timber.

A planting programme of 150 acres annually should, the Conservator estimates, increase the potential annual yield by 102,500 cubic feet which, added to the output of existing plantations, should bring the future annual yield of saw timber to 146,000 cubic feet.

20. We have been advised that the Ten Year Plan would necessitate an addition of four to the number of European Foresters, at the sixth year, bringing the total of the establishment to nine. But we do not think that we are unduly optimistic in saying that by 1950 or 1951 the Polytechnic should have produced Africans who will be capable of doing the work of a European Forester in their own country, or of the three European Clerks.

Y. Miscellaneous.

21. We have noted the advice of the Conservator of Forests that saw mills are not, at present, an economic proposition in Nyasaland because the present plan is to defer any clear felling of plantations until the remaining natural forests have been utilised. While we realise that Mlanje Mountain forests are in small scale scattered blocks, in difficult country, we consider that investigation of the methods in other countries should be made, more especially in view of the increasing use of mechanical means of haulage over rough ground. We do not consider that the present carriage of timber by head loads should continue where other means are possible.

22. We advise that the Forestry Department should collaborate with the Municipalities of Blantyre and Limbe in the establishment of a Botanical Garden-Arboretum, at which seedlings of various kinds could be sold. The area round the Hynde Dam may be found suitable for this purpose and we point out that facilities of this kind are usual in most Colonies.

23. From the purely productive aspect, private enterprise in Forestry has, in the past, not been unsatisfactory. Eucalyptus grows well in the Shire Highlands and many estate owners have established plantations. Indeed, the area of plantations is greater than is necessary for individual estate use. But many acres of plantations are stagnant for lack of thinning and they are often damaged by fires and, in some cases, the suppression has gone so far that felling and a fresh start is needed. In these private plantations there is a challenge to commercial enterprise, which has hitherto been lacking.

24. In paragraph 7 we have said that there are, or are about to be, 64 Forest Reserves. We do not regard these reservations as inviolable: there are the increasing demands of agriculture to be considered, and, in our opinion, the retention of some of these Forest Reserves must be subordinated to tsetse-fly control.

In this connexion we remark upon the number of small Game Reserves, some of which are co-terminous with the Forest Reserves, and recommend that their retention should be investigated at an early date as the possibly permanent habitat of the tsetse-fly and from the point of view of their utility for the preservation of game.

25. In Appendix I to this Interim Report we submit an estimate of the capital and recurrent costs which our recommendations, if accepted, would entail. It is necessarily approximate and we have no means of ascertaining what post war costs will be. By the use of the letters N or C we indicate our opinions whether the cost should be a debt against Nyasaland funds or whether the object is suitable for an application under the Colonial Development and Welfare Act.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*)

G. H. ADAMS

W. TAIT-BOWIE

M. P. BARROW

H. G. DUNCAN

A. F. BARRON

J. A. LEE

+ FRANK NYASALAND

J. MARSHALL

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

2nd August, 1944

APPENDIX I.

LONG TERM PLAN OF FORESTRY DEVELOPMENT (TEN YEARS).

I. *Production of Saw Timber for the needs of the African Rural Population.*

First five years	5,500 acres		
Second five years	11,000	..	
	16,500	.. at £5 an acre	£82,500
Tools and Equipment			£5,500
			£88,000 C

II. *Extension of Existing Planting Scheme (Urban and Industrial Timber Supply).*

(a) Existing programme	105 acres per annum		
(b) Extension planned	25		
(c) Preliminary provision for Mlanje bauxite industry	20		
	150 acres per annum		
Over a period of 10 years	1,500 acres at £5-10s.-0d. per acre	...	£8,250 N

III. *Extra European Staff (additional to estimate already submitted)*

(a) Four extra European Foresters Commencing in the 6th year			
4 (for five years) at £2,040		£8,160	
(b) Three European Clerks (for ten years) at £4,422		£13,266	...
			£21,426 N
(c) Travelling of 4 Foresters (5 years at £100 each)			...
			£2,000 N

IV. *Extra African Field Staff.*

Forestry Supervisors—			
24 for 10 years (£170 each)	...	£4,080	
24 for 9 years (£146 each)	...	£3,504	
24 for 8 years (£124 each)	...	£2,976	
24 for 7 years (£104 each)	...	£2,496	
16 for 6 years (£86 each)	...	£1,376	...
			£14,432 N

V. *Tools and Equipment.*

Allowing 6s.-8d. per acre for 1,500 acres	...		£500 N
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VI. *Capital Costs.*

(a) Housing 3 European Foresters 3 Clerks	at £800	£4,800 N	...	N
(b) Housing 112 Forestry Supervisors	at £30	£3,360 C	...	C
(c) Tents, etc.		£300 N	...	N
(d) Offices		£1,200 N	...	
				£9,660

TOTAL ... £144,268

No. 7—DEMOBILISATION.

YOUR EXCELLENCY :

The Post-War Development Committee beg to submit the following Interim Report upon questions of demobilisation of both Europeans and Africans in Nyasaland.

I. European Demobilisation.

We understand that East Africa Command sent a questionnaire to all European members of the Forces in the Command some time ago and we have been told that the replies received from those who joined the army from Nyasaland have been few and scanty.

2. Accordingly, in February, 1944, a further questionnaire was issued by the Nyasaland Government, on our advice, to some 127 Europeans, asking for details of their personal and family circumstances: and, in particular, what was their employment before enlistment; how long they had been resident in Nyasaland before the war; what, if any, arrangements had been made for them to resume their former employment on discharge; to what occupation and to what country they desired to return; what arrangements they had made in this respect; whether they had had any vocational training whilst with the Forces; whether they would require assistance in finding employment; what qualifications they had; whether they desired vocational training on demobilisation, and whether they needed financial assistance for such training. The form which was issued made it clear that it constituted no commitment on either side. We learn that replies from some 60 Europeans had been received by August, 1944, and that the necessary enquiries and references are being made.

II. African Demobilisation.

3. For the purpose of considering demobilisation problems we classify Nyasaland African soldiers as follows —

- (a) the former cultivator, or home producer, on Native Trust Land;
- (b) the African soldier whose home is on privately owned land and who formerly grew cash crops as a tenant;
- (c) the young soldier who was a potential wage earner before enlistment and who will wish to seek employment under conditions as regards wages and living comparable with those he has experienced in the army;
- (d) the man who has seen service in the various Transport corps, or who has worked in a semi-skilled capacity, but who has not attained a sufficient standard of technical efficiency for civil employment without undergoing further training.

Taking the above classes *seriatim* :—

Class (a), the majority of these will be absorbed naturally into the tribal system.

Class (b), we have little doubt that these men will be welcomed on the private estates which they left.

Class (c), this class will constitute the bulk of enlisted Africans from this territory and, for the purpose of reabsorbing these men into civil life, we advise that Labour Registry Offices should be established in each of the two Provinces and that they should be staffed by District Officers and African clerks who have had service with the troops.

We propose that these Registry Offices should first be established within the precincts of the Demobilisation Camps and that at each District Headquarters there should be a sub-registry where prospective employers, both in Nyasaland and from elsewhere, should be invited to register their requirements with definite contractual details of the type of work, conditions given, and of the salary offered. On demobilisation, the African leaving the Forces should, in the same transaction, register his qualifications and wishes with the Labour Officer appointed for the purpose.

4. In making the foregoing recommendations we emphasize that the position in Nyasaland differs in many respects from that of other East and Central African territories because of the large scale temporary emigration of Nyasaland natives to South Africa and to Southern Rhodesia where wages are more attractive. We think that many of our returned soldiers will undoubtedly join, or rejoin, the migrant class which, after returning home for a holiday, either remain in Nyasaland or return to work in the south.

5. We consider it essential that demobilisation should be gradual, partly to lighten the burden upon transport, partly to ease the strain on the Army Pay Corps, and partly to facilitate arrangements in Nyasaland.

6. We are strongly of opinion that Nyasaland troops should return in units, or other suitable military formation, under their own Military officers and that they should remain under their control until they are "taken over" by the Civil officers detailed to receive them at the Demobilisation Camps.

7. We are gratified to learn that a card-index system has been started in Nyasaland, on which is entered the name and particulars of every native soldier; and we have been informed that East

8. We agree that the discharge certificates of soldiers who have learnt a trade should give full information of the man's abilities and are informed that the discharge certificate now used in the Command does not give sufficient information. Moreover, we are of opinion that the discharge certificate should be compiled in the man's own unit, and not by any special military demobilisation staff.

9. We have mentioned the difficulty of transport; it is not usually recognised that the distance by road between Nyasaland and e.g. Nairobi is greater than the distance between Edinburgh and Rome, and we suggest that before the conclusion of hostilities Government should take up the question of the provision of sea transport, from Mombasa, or elsewhere, to Beira, for troops returning to Nyasaland for demobilisation.

10. We were given to understand that a convenient number for discharge would be 2,500 men a month and that Demobilisation Camps at Lilongwe and at either Zomba or Blantyre would be necessary, but we remark that if sea transport can be used the proposals regarding the sites for Demobilisation Camps may require adjustment.

11. Having regard to the spendthrift characteristics of the average African, we consider that further representations should be made by the Nyasaland Government to East Africa Command for a system of deferred pay, if necessary in concert with the other East and Central African Conference Governments, and that it is essential for the system to be introduced forthwith.

12. As regards the payment of gratuities, we are of opinion, that askari should be given a gratuity certificate drawable on the District Commissioner of his District and that a duplicate of this certificate should be sent to that District Commissioner. This recommendation is made in order to enable the Administration to do what is possible to conserve the gratuity, and to avoid discharged men delaying their return to their homes.

13. We are informed that in Kenya it is proposed that Army tradesmen should receive further all-round training before they are sent back to civil life. We think it most desirable that the Army should set up training schools preparing the about-to-be discharged soldier for civil life as, we understand, is intended both in the United Kingdom and in India. Also we see no reason why certain discharged askari should not be given what further training is possible at the proposed Native Industrial Training Depot, or Polytechnic, in Nyasaland, concerning which the Committee has made recommendations in its Interim Report on Education.

14. We advise that dressers, nursing orderlies, and sanitary assistants discharged from the Army, should have a refresher course arranged by the Medical Department before being absorbed into the Department or into other employment in Nyasaland.

15. We remark that it is essential for men needing special medical treatment to receive it as near their own homes as possible and, in these circumstances, we recommend that Nyasaland should make provision for those needing permanent special treatment.

16. We recommend that Government should now prepare pamphlets and lectures, and other forms of propaganda, for the African soldier on discharge to show him the ways in which, by working on his own account, he could make a living out of the land in Nyasaland. This effort should not, in our opinion, end at the Demobilisation Camps, but should be continued, on an agreed plan, in the districts; and here we remark that there is a need to ensure the sympathies of native women with the object in view.

17. Finally, we assume that Government Departments, private employers and the Native Authorities in Nyasaland will give priority to ex-soldiers amongst those seeking employment.

We have the honour to be,

Sir,

Your Excellency's most obedient servants,

JUXON BARTON (*Chairman*)

G. H. ADAMS

W. TAIT-BOWIE

M. P. BARROW

H. G. DUNCAN

A. F. BARRON

J. A. LEE

J. MARSHALL.

(Note—Difficulties of communications prevented the Bishop of Nyasaland receiving the final draft of this report before it was necessary to print it).

2nd August, 1944.

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

No. 8—EDUCATION (POLYTECHNIC).

YOUR EXCELLENCY:

The Post-War Development Committee beg to submit the following Interim Report containing recommendations for the inauguration of a Polytechnic.

1. General.

In paragraph 3 of our Interim Report No. 2—Education—we made the following recommendation:—

“VOCATIONAL TRAINING.

We recommend that an Industrial Training Centre, or Polytechnic, where both elementary and specialised courses could be given, should be instituted. We consider, further, that the proposed Institution should be the centre of a scheme incorporating existing Missionary and other vocational training institutions. We consider that, e.g., the Agricultural, Veterinary, Forestry and Public Works, Posts and Telegraphs, etc., Departments should all have their training schools at this one centre and that “departmentalism” should be stopped. We realise that it will be necessary for certain literary subjects to be taught and we are of opinion that clerical courses should be taken at this centre. We do not consider that the Polytechnic should become purely an Education Department institution, and we advise that the Principal should be a non-technical officer.

It will be seen that our proposals for one institution are intended to avoid dissipation of effort, unnecessary duplication of certain of the staff and the obvious economy in building costs. It is our earnest hope that the Institution which we recommend should not be deferred until the post-war years. We have in mind that it should serve the needs of the African, Asian and the Coloured population. We understand that it may be possible for the Northern Rhodesia Government to participate in the proposed institution.”

In paragraph 37 of the same Report we stated as follows:—

TECHNICAL SCHOOLS AND TECHNICAL COURSES.

The Committee note that the Education Advisory Committee considers that until a Technical Adviser is appointed to the Education Department it seemed impracticable to bring professional technical training within the five year development plan.

The Committee, however, refers to, and emphasizes, its recommendation in paragraph 3 above, upon which it is understood a scheme is now being prepared, that a Native Industrial Training Centre, or Polytechnic, should be inaugurated as soon as possible by Government.”

In Appendix II of that Report we made a tentative estimate of £50,000 capital and £8,000 per annum recurrent expenditure for such an institution.

2. The Government departments do not at present provide regular technical or professional courses other than the Medical and Agricultural Departments and the latter Department is anxious to move its Agricultural school to a better site. It is considered that all the technical training required by the major Government Departments can be grouped at a single training centre or Polytechnic, except that of the Medical and Printing Departments. It is not intended that the Polytechnic should train only for the Government services, but should also cater for the requirements of the commercial and planting communities and the Missions.

3. The following scheme envisages a good deal of general development in Nyasaland in the post-war years and is intended to produce a regular flow of skilled African artisans, technicians, agricultural, forestry and veterinary assistants for the employment created by general development on a progressively increasing scale. Until the effects of the education development plan begin to increase the output of the schools, the supply of properly qualified candidates for the polytechnic courses will be below the capacity of the institution, but in the immediate post-war years it is anticipated that this shortfall will be compensated for by the admission of ex-service men to intensive training courses, for whom the academic standards of admission should, where necessary, be relaxed.

4. For the first few years, there will undoubtedly be many married Africans, including retired soldiers, who will wish to take advantage of the facilities offered by the Polytechnic. For this reason, we recommend that a model village be established within the precincts of the Polytechnic where married students may live with their wives and families and attend the Polytechnic as day pupils. Provision has accordingly been included in the scheme for the construction of quarters for married students. It may be anticipated that before very long candidates for the Polytechnic courses will be provided exclusively from the schools and therefore it is proposed that the accommodation for married students should be of a temporary nature only.

2. Details of Scheme.

5. In view of the foregoing it is considered that the Polytechnic should be planned for an eventual maximum capacity of 500 trainees, taking the following courses:—

(1) *Artisans*

Builders and Cement Workers	...	...	...	76	
Carpenters and Joiners	...	...	...	50	
Fitters and Plumbers	...	...	...	25	
Blacksmiths	...	...	...	25	
House and Sign Painters	...	...	...	25	
Mechanics	...	...	...	25	225

(2) *Posts and Telegraphs*

Postal and Telegraph Assistants	...	...	...	75	
Einemen					

(3) *Commercial*

Clerks	...	...	...	50	
Accountants	...	...	...	50	100

(4) *Agricultural Instructors* 50

(5) *Veterinary Instructors* 25

(6) *Forest Supervisors* 25

500

6. A suitable site for an institution of such dimensions has been found on land recently purchased by Government, the Mpemba Estate, some nine miles from Blantyre. The area available will be at least 3,000 acres. Bore-holes recently sunk have shown that a water supply adequate for all requirements is assured. Apart from the land required for buildings, playing fields and quarters, the estate can be conveniently divided into arable, grazing and forest lands. The maintenance and exploitation of these lands will provide ample facilities for the field work of the agricultural, veterinary and forestry students. This practical field work should also keep before the technical and clerical students examples of correct land usage and of good husbandry and assist in the food supply of the whole institution. It is considered that the administrative and financial control of this "polytechnic estate" should come under the Principal of the Polytechnic, but that its development should follow a plan of management drawn up by the Agricultural, Veterinary and Forestry Departments which would include provision for periodic revision in consultation with these Departments.

7. The education plans now being carried into effect provide for two school courses in the primary schools, the Junior Course completed at the end of Standard III and the Senior Course at the end of Standard VI. It would be convenient to organise admission to the polytechnic courses in relation to these school courses. Thus, pupils completing the Junior Course and not proceeding to the Senior Course or to teacher training would have the choice of entering certain courses at the polytechnic. Those completing the Senior Course and not going on to secondary education, teacher or medical training would be eligible for admission to any polytechnic course. With this consideration in mind the following are recommended as the minimum entrance qualifications and the period of training necessary.

(1) *Artisans.*

A four years' course after completion of the Junior Course. With the general development contemplated above it may be assumed that there will be sufficient building work in various parts of the Protectorate to enable the employment of third and fourth year artisans on actual jobs under the supervision of polytechnic staff. Such an organisation would improve facilities for practical training and would reduce the costs of the building work undertaken. It would make possible a larger annual intake of men without increasing polytechnic expenditure to any great extent, since expenditure on outside work would be chargeable to that work.

(2) *Posts and Telegraphs.*

Postal Assistants, Telegraph Assistants, a three years' course post-Senior Course.
Linemen. A three years' course, post-Junior Course.

(3) *Commercial.*

Clerks, Accountants, a two years' course post-Senior Course.

(4) *Agricultural.*

Agricultural Instructors, a two years' course post-Senior Course.

(5) *Veterinary.*

Veterinary Instructors, a two years' course post-Senior Course.

(6) *Forestry.*

Forest Supervisors, one year course post-Junior Course.

From this group four men per annum will be selected for a further two years' course of training as Forest Rangers.

3. Finance.

8. In Appendix I to this Report we submit an estimate of the capital and recurrent costs which this scheme, if accepted, would entail. These estimates, the totals of which are as follows, are necessarily approximate only:—

	£
1. Capital expenditure	118,915
2. Permanent Equipment	6,100
3. Purchase of land	5,800
4. Recurrent Expenditure 1st Year	23,184
rising in the fifth year to	26,462
Total expenditure over five years	£249,559

We consider that this project is a suitable one for an application for a grant from the Colonial Development and Welfare Act.

4. Conclusion.

9. We feel bound to record our doubts as to whether the finances of the Protectorate would be able to bear recurrent expenditure in maintaining the Polytechnic after such grant as may be made from the Colonial Development and Welfare Act had lapsed, and also whether all those trained at the Polytechnic could be absorbed into employment in Nyasaland. We recommend, therefore, that the adjoining territories of Northern and Southern Rhodesia should be invited to participate in the scheme on a contributory basis on the understanding that a quota of those trained at the Polytechnic would be available for employment in those territories. We feel that such a joint arrangement would be in accordance with the accepted policy for the co-ordination of certain services in the three territories.

We do not wish to suggest, however, that the scheme should be held up on this account. On the contrary, we strongly recommend that it should be proceeded with as soon as possible and that, in view of the present shortage of technical staff in the Public Works Department, the construction of the Polytechnic should be undertaken by a firm of contractors.

We have the honour to be, Sir,

Your Excellency's most obedient servants,

D. W. SAUNDERS-JONES (*Chairman*)

G. H. ADAMS

W. TAIT BOWIE

H. G. DUNCAN

A. F. BARRON

J. A. LEE

G. G. S. J. HADLOW

J. MARSHALL

(NOTE—Mr. M. P. Barrow and the Bishop of Nyasaland were both out of the country when this Report was considered).

HIS EXCELLENCY THE GOVERNOR
OF THE NYASALAND PROTECTORATE.

2nd July, 1945.

APPENDIX I.

ESTIMATES OF CAPITAL AND RECURRENT EXPENDITURE.

1. CAPITAL EXPENDITURE.

<i>Admin. and School</i>								
2 (280 x 30) Class Room Blocks	...	...	...	...	...	...	£5,175	
2 (110 x 28) Admin.	...	...	...	...	...	...	2,810	
185 x 50 Hall	...	...	...	...	...	...	3,875	
30 x 18 Store	...	...	...	...	...	...	180	£11,040
<i>Sanatorium</i>								
140 x 34	...	...	...	...	...	...	2,880	2,880
<i>Workshops and Latrines</i>								
320 x 30	...	...	...	...	...	...	£3,200	
150 x 30	...	...	...	...	...	...	1,500	
60 x 30	...	...	...	...	...	...	600	5,800
<i>Power House</i>								
55 x 26	...	...	...	...	...	...	£540	
Power plant (incl. alt. and switch)	...	...	...	...	...	...	2,000	
Crane	...	...	...	...	...	...	300	
Fuel storage	...	...	...	...	...	...	600	
Boiler	...	...	...	...	...	...	1,000	
Chimney	...	...	...	...	...	...	200	
Incinerator	...	...	...	...	...	...	150	4,250
<i>Dormitories</i>								
8 (280 x 26) Dormitory Blocks	...	...	...	...	...	...	£21,840	
2 (320 x 35) Dining and Common	...	...	...	...	...	...	8,400	
(45 x 40) Kitchen (Excl. of equipment)	...	...	...	...	...	...	900	
(40 x 16) Stores	...	...	...	...	...	...	215	
4 Food Stores	...	...	...	...	...	...	2,400	33,755
<i>Laundry</i>								
230 x 40	...	...	...	...	...	...	£3,450	3,450
<i>Covered Way</i>								
550 x 10	...	...	...	...	...	...	£1,400	1,400
<i>R.C. Water Tank</i>								
24,000 Galls.	...	...	...	...	...	...	£2,000	2,000
<i>Miscellaneous</i>								
Kitchen equipment	...	...	...	...	...	...	...	9,650
Steam Piping	...	...	...	...	...	...	...	
Water supply, wellheads, piping bore-holes	...	...	...	...	...	...	...	
Firefighting Equipment	...	...	...	...	...	...	...	
Workshop Equipment	...	...	...	...	...	...	...	
Anti-malarial Work	...	...	...	...	...	...	...	
Telephone	...	...	...	...	...	...	...	
Roads and Paths	...	...	...	...	...	...	...	
School Furniture	...	...	...	...	...	...	...	
Playing Fields	...	...	...	...	...	...	...	
<i>Dwelling Houses</i>								
Grade II House	...	...	...	...	...	...	...	26,300
17 Grade III Houses	...	...	...	...	...	...	...	
24 African Staff Quarters	...	...	...	...	...	...	...	
Garage and Equipment Shed	...	...	...	...	...	...	...	
Sewage Disposal	...	...	...	...	...	...	...	2,500
100 Married students' quarters at £25 each	...	...	...	...	...	...	...	500
20 labourers' houses at £25 each	...	...	...	...	...	...	...	2,400
Polytechnic chapel	...	...	...	...	...	...	...	
Buildings and equipment for Agricultural, Forestry and Veterinary field work	...	...	...	...	...	...	...	3,180
Total								108,105
10% Contingencies								10,810
Permanent Equipment (details see Appendix II)								6,100
Purchase of land								5,800
Grand Total								£130,815

(N.B.—Description of buildings is given in Appendix III).

2. RECURRENT EXPENDITURE.

	1st Year	2nd Year	3rd Year	4th Year	5th Year
PERSONAL EMOLUMENTS.					
	£	£	£	£	£
1. Principal, £1,000 x £50 to £1,100...	1,000	1,050	1,100	1,100	1,100
2. Technical Superintendent, £720 x £30 to £840 by £40 to £920	720	750	780	810	840
3. Resident Mechanic, £480 by £20 to £600	480	500	520	540	560
4. 9 Technical Instructors, £540	4,860	4,860	4,860	4,860	4,860
5. Posts and Telegraph Instructor, £480 by £20 to £600	480	500	520	540	560
6. 2 Commercial Instructors, £480 by £20 to £600	960	1,000	1,040	1,080	1,120
7. Agricultural Officer, £450 by £25 to £600—£660 by £30 to £840	450	475	500	525	550
8. Veterinary Officer, £600—£600, £630 by £30 to £720—£750 by £30 to £840	600	600	630	660	690
9. Forester, £480 x £20 to £600	480	500	520	540	560
AFRICAN STAFF.					
10. 9 Technical Instructors, £20 x £2 10s. to £30 by £4 to £50 by £5 to £100	180	202—10	225	247—10	270
11. 2 Commercial Instructors, £30 x £4 to £50 x £5 to £75 by £5 to £125	60	68	76	84	92
12. 3 Agriculture Instructors, as for 11	90	102	114	126	138
13. 2 Veterinary Instructors, as for 11	60	68	76	84	92
14. 1 Forestry Instructor, as for 11	30	34	38	42	46
15. 1 Correspondence Clerk, as for 11	30	34	38	42	46
16. 1 Accounts Clerk, as for 11	30	34	38	42	46
17. 1 Quartermaster, as for 11	30	34	38	42	46
18. 1 Driver, as for 11	30	34	38	42	46
19. 1 Mechanic, as for 11	30	34	38	42	46
20. 2 Cooks at £1 per month	24	24	24	24	24
21. Labour	620	620	620	620	620
Total Personal Emoluments	11,244	11,523	11,833	12,092	12,352
OTHER CHARGES.					
22. Passages	2,170	—	4,340	—	4,340
23. Local Transport	50	50	50	50	50
24. Maintenance of Students	3,000	3,000	3,000	3,000	3,000
25. Personal Allowance to Students	1,750	1,750	1,750	1,750	1,750
26. Clothing	1,500	1,500	1,500	1,500	1,500
27. Soap and toilet paper	250	250	250	250	250
28. Blankets	750	750	750	750	750
29. Upkeep of power house, light and water installations	500	500	500	500	500
30. Upkeep of Motor vehicles	200	200	200	200	200
31. Upkeep of grounds	50	50	50	50	50
32. Maintenance of buildings and equipment	375	375	375	375	375
33. Materials. (a) Workshops £700 (b) Other sections £300	1,000	1,000	1,000	1,000	1,000
34. Office stationery	40	40	40	40	40
35. Library	25	25	25	25	25
36. Uniforms for staff	30	30	30	30	30
37. School materials	200	200	200	200	200
38. Incidental expenses	50	50	50	50	50
Total Other Charges	11,940	9,770	14,110	9,770	14,110
TOTAL PERSONAL EMOLUMENTS	11,244	11,523	11,833	12,092	12,352
TOTAL OTHER CHARGES	11,940	9,770	14,110	9,770	14,110
GRAND TOTAL RECURRENT EXPENDITURE	23,184	21,293	25,943	21,862	26,462

APPENDIX II.

PERMANENT EQUIPMENT.

		£
1.	Workshop equipment	2,400
2.	Dormitory Furniture	800
3.	Hall equipment	100
4.	Library Books	250
5.	Posts and Telegraphs	500
6.	Lorry	750
7.	Station Waggon	600
8.	Offices	200
9.	Ox-mower	200
10.	Science room	200
11.	Museum	100
		£6,100

APPENDIX III.

NOTES ON CAPITAL EXPENDITURE.

The buildings fall into four groups.

1. School Buildings.
2. European Staff Quarters.
3. African Staff Quarters.
4. African married students' houses.

The school building group can be sub-divided again into three sections.

- (a) Classrooms and Administration.
- (b) Dormitories.
- (c) Workshops, Power House, etc.

2. SCHOOL BUILDINGS.

(a) CLASSROOM AND ADMINISTRATION.

Accommodation. 6 Classrooms for 24 students each.

Fitted with dais and full width blackboards.

Cross ventilated with hospital type hopper windows.

Shelving and cupboards under windows.

Museum. For use of Agricultural, Forestry and Veterinary departments.

Fitted with Shelving, cupboards and specimen cases.

Library. Fitted with bookshelves and tables and chairs for reading and study.

Drawing Office. With drawing benches, materials store, dais, blackboard.

Science Room. With dais, blackboard, Fume cupboard, benches, sinks and gas.

Offices.

Headmaster.

Clerks.

Records fitted with Shelving.

Medical Officer.

African Staff Common Room.

European Staff Common Room.

Lavatories and W.Cs. for African and European Staff.

Stationery Store.

Assembly Hall. To seat 500 students, with stage and store. If required a balcony and cinema projection box can be incorporated.

(b) DORMITORIES.

16 Units consisting of:—

Dormitory for 25 students including a prefects' cubicle.

Locker Room with 24 cupboards.

Ablution Room with 6 Showers.

W.C.

Urinal.

Hand basins.

2 Stores for students' clothing, boxes, etc.

6 Common Rooms with fireplaces.

2 Dining Rooms to seat 150 each it being considered that it will be possible to stagger the meals.

Kitchen with ancilliary stores, silos, etc. Cooking will be done by steam supplied from the Power House.

Dormitory Superintendent's Quarters consisting of an office, bedroom, bath and W.C.

Laundry Block where students will wash their clothes, consisting of two washing rooms with slabs, two ironing rooms and a steam-heated drying room.

Sanatorium or sick bay for 20 beds divided into two wards with the necessary ancillaries.

(c) WORKSHOPS AND POWER HOUSE, ETC.

Students' Latrines consisting of:

22 W.Cs. and urinal.

Changing Room with 4 showers and benches.

Dispensary with sink, etc., for first aid.

Store for School furniture.

Shops. These buildings are open on one side and all facing on to a yard which can be locked.

Building Shop with store.

Carpenters' Shop with Timber store.

Fitters' Shop with store.

Blacksmiths' Shop with store.

Machine Shop with store.

Painters' Shop with store.

Post and Telegraph Shop with store.

Power House containing—

Two Diesel Engines and 220V 3 phase alternators.

Complete with switchboard, fuses, voltage control.

Cooling tower, silencers, etc.

Travelling crane for overhauls.

Fuel tank of a capacity for 4 weeks' running.

Oil-fired boiler to supply steam to Kitchen and Laundry.

Workshop.

Incinerator.

3. EUROPEAN STAFF QUARTERS.

1 Grade II bungalow for Headmaster with servants' quarters, bath and latrines.

17 Grade III bungalows for other European Staff with servants' quarters, etc.

24 Quarters with showers, latrines, etc.

4. AFRICAN MARRIED STUDENTS' QUARTERS.

£25 each will provide two rooms, verandah, kitchen, bathroom and store constructed of sun-dried brick or pise-de-terre with a grass roof and earth floor.

5. SCHOOL CHAPEL.

A rectangular building divided into two sections, of which one would be used by Roman Catholics and the second by other denominations.

6. OTHER BUILDINGS AND EQUIPMENT.

Reinforced Concrete water tower 24,000 galls. capacity.

Sheds at each wellhead for pumping machinery.

Garages for school lorries and equipment.

Playing fields to be levelled and drained.

Telephone line from Blantyre with sub-exchange.

Anti-malarial work.

Roads, paths and gardens.

Sewage disposal plant.

Hoses and fire fighting equipment.

CONSTRUCTION.

Foundation. Concrete. Depth and spread to be decided after trial holes have been dug.

Walls. Brick in lime mortar with cement pointing.

Generally 18 ins. thick ground floor, 14 ins. First Floor.

Floors. Ground Floor—Concrete with cement or granolithic finish.

First Floor. Reinforced Concrete Hollow Tile with cement or granolithic finish. Under-side plastered to form ceiling.

Roof. Timber with plaster ceiling and tile covering.

Stairs. Fire-resisting reinforced concrete construction.

Non-slip treads and W.I handrails.

Joinery. Hardwood to detail or steel.

Plumbing. Water-borne sanitation throughout. Glazed earthenware or cast iron piping. Best quality white glazed fittings.

Water Supply pipes solid drawn galvanised iron or copper piping. Fittings chromium plated.

Lighting. Electric light throughout, wiring to be in conduit and to B.S.S. standard.

Lightning Conductors. Efficient system of protection properly earthed.

AGRICULTURAL DEVELOPMENT IN NYASALAND.

This report is intended to be an amplification of plans for Agriculture and Land Usage which have been prepared by officers of the Department of Agriculture and which are set out in Attachments I and II respectively to this report.

1. The objects of Agricultural development in a country depending entirely on the products of agriculture for its existence must aim at the establishment of a stable and prosperous farming industry capable of supplying ample and good food for all and of producing crops for sale which can compete on the world's markets. Dependence on one industry is unavoidable unless mineral wealth and secondary industries exist and it is therefore all the more important to ensure that planning for the future is based on the conception of gradual and well balanced progress.

2. In the post-war years one of the biggest problems we shall come up against will be the marketing of economic crops. If the primary producer is again to be left at the mercy of price fluctuations as he has been in the past there is little hope of achieving our objective of a stable and prosperous industry.

In looking at the countries of the world it is very seldom that prosperity is found amongst the peasants in countries dependant almost entirely on agriculture. The exceptions are countries like Denmark where the industry is well organised and where the co-operative movement is highly developed.

3. It is often considered that European and African Agriculture are incompatible and that the interests of the two must clash when both races farm in the same territory. It is firmly believed that this is a wrong conception and that the two interests can be and should be complementary. There is no doubt that the European Tea and Tung industries are at present prosperous and the country as a whole benefits from their prosperity. It is, however, often over-looked that European Agriculture in Africa is dependant on the African who provides the labour essential for proper farming and therefore everything possible should be done to give the African a share in the prosperity of the industry. If the idea is accepted that the European provides the capital and management and the Africans the labour then there is no reason why certain undeveloped areas of the Protectorate should not be developed on a co-partnership basis.

4. One of the fundamental handicaps to Agricultural development in Nyasaland is lack of education. It cannot be expected that an uneducated peasantry will appreciate the urgent necessity of measures to combat soil erosion. It is, after all, only within recent times that European races have become aware of the dangers of soil erosion and even today there are still European farmers in this country who appear to be unaware that the fertility of their soil is not an inexhaustible capital asset which can be drawn upon unceasingly. More and better education is a prerequisite to better Agriculture and owing to the serious time lag we must educate the adult as well as the child. A steady stream of carefully prepared propaganda is essential but it must be so put that the African is not swamped by a flood of instruction and advice which will merely end by drowning him completely without hope of salvation.

5. It is important that once the main lines of agricultural development have been accepted they are not changed except in matters of detail. The frequent changes in leadership of Departments make for frequent changes in policy which is most undesirable. Farmers all over the world, no matter what their race and colour may be, resent most strongly and cannot be expected to appreciate, far reaching changes in farm practices every few years. Farmers are blamed for conservatism but long experience down the centuries has shown that farm practices cannot be changed successfully with a mere sweep of the wand and no farmer is willing to accept innovations unless he can be assured that they are worth while and can fit in with his economy.

Bearing this in mind it has to be recognised that any plans for agricultural development, particularly in Africa, must not only deal with short term matters of urgency but must also be drawn up on a long term basis and by long term is meant anything from 50 to 100 years. It is impossible for man to see into the future, nevertheless it should be possible to plan development so that nothing done now will prejudice long term development.

6. It is desirable to make clear at the outset that this report does not in any way pretend to be the last word in agricultural development. Conditions continually change; new discoveries and inventions are made; and new ideas come to light which make it essential that any plan dealing with such a vast subject as agriculture should be flexible and progressive. All that is attempted here is to indicate the basic necessities for development as they appear now and to present suggestions as to how they may be provided.

7. Farming must develop along sound balanced lines and it is important that those responsible for the execution of development plans should not be expected to produce spectacular results. Progress in Agriculture must keep in step with the general progress of the people while research and experimentation must be well ahead of it.

8. The activities of the three big development departments—Medical, Education and Agriculture must be very closely linked in all future planning and execution of plans. None of

them can stand alone or work in a water-tight compartment if basic development is to proceed to a steady balanced plan. Without education it will be virtually impossible to persuade the farming community to adopt improved methods of cultivation; without proper nutrition, health improvement schemes will be largely nullified and without better health the African child and adult will not be able to absorb the new learning. Although this plan is in fact a departmental one the need for closest co-operation between the development departments is fully recognised throughout.

Food Crops.

9. As the attached memorandum rightly stresses the production of ample and good food must take the highest place in agricultural development. Too often in the past have food crops been left to take care of themselves while money and research have been made available for the increased production of cash crops.

10. With the present system of Agriculture we are faced with a gradual deterioration in the yields per acre of food crops which in turn means a gradual increase in area devoted to their production. The deterioration in yields is due to a general lowering of soil fertility brought about by erosion and over-cultivation. The first problem then is to increase yields per unit area and this can only be solved by better varieties and by better farm practice.

11. While it is hoped that Nyasaland will continue to be closely connected with the East African Agricultural Research Institute and Service the problem of improving foodcrops must continue largely to be a local one. It is therefore proposed that a Plant Breeder for foodcrop work should be appointed. For convenience he would be stationed at the proposed Tobacco Research Station at Lilongwe which would become a first order experiment station. Improvement in yields of foodcrops is not merely a matter of new varieties. Questions such as time to maturity, palatability, disease resistance, etc., have to be carefully considered.

12. The two staple foods are maize and cassava supplemented by beans, groundnuts and sweet potatoes and also by meat and fish when available. The supplementary foods also need attention and more variety. Cultivation of vegetables and fruit by the people should be considerably extended and the work being done at the departmental farm at Mwera Hill is designed to this end.

It is considered that vegetable and fruit plots should be established at all schools particularly boarding schools with a view to making the children familiar with a variety of nutritious supplementary foods.

13. Food storage is a problem which needs further investigation. Periodic bad seasons cannot be overcome but care can be taken to ensure that sufficient food is available to carry the population over part, at any rate, of the food shortage period. Maize is a difficult crop to store in bulk but there is no reason why the present experiments with communal granaries under charge of the Chiefs should not be extended considerably so that eventually every village has its food stores which can only be used on the express instructions of the Chief. If this policy were to be linked with the provision of small maize mills it would probably be easier to get over to the people.

The people are already required wherever possible each to establish a plot of Cassava for famine purposes but we are still a long way off complete fulfilment of this aim. This is partly due to the fact that sufficient quantities of planting material are not as yet available, but special plots to provide this are being established in various parts of the country.

14. At present most of the Cassava grown is of the short term type. A point to be investigated is whether it is not preferable that famine plots should be planted with long term varieties and that digging up the crop on these plots should only be permitted under instructions issued by the Chiefs. Much work is still required on the testing of mosaic resistance, varieties, palatability, etc. The appointment of a Plant Breeder for food crops would enable local aspects of these problems to be tackled properly. One matter needing urgent attention is the pitifully low yields of Cassava obtained at Kota Kota where this crop is the staple diet.

General Agricultural Practices.

15. It is fundamental to any plans for improving farming conditions whether they be for foodcrop or for cash crop production that the basic farm practices should be sound.

In the first place it is vital not only to the interests of the present population but even more so to posterity that the land must be well cared for. Land belongs to the nation: it is this country's only real capital asset and no individual should be permitted to destroy or to depreciate that which is vital to the life of the community.

16. The processes of soil erosion and deterioration are active all the time although not always visible to the eye. Fortunately, spectacular gully erosion is not serious in Nyasaland but the more insidious and dangerous form of sheet erosion is present everywhere. The policy of ridge cultivation and of box ridges is a most effective check to sheet erosion provided cultivation is not done on too steep slopes, but such methods need in many cases to be reinforced by major protective works such as storm drains around the bases of hills. Neither does ridge cultivation in itself counteract the most serious loss in fertility and soil structure due to over-cultivation.

17. It has been proved beyond doubt that tropical soils cannot stand up to continuous cultivation. Their crumb structure breaks down very rapidly and not only do they lose fertility but the loss of structure renders them liable to sheet erosion.

18. Our problem is thus two-fold—to keep the soil *in situ* and to preserve and increase its fertility. The report on Land Usage in the attached memorandum deals with the question of soil erosion and is attached hereto as it is complete in itself and fully acceptable as providing the means whereby this vitally important problem can be solved. •

The question of checking soil deterioration is dealt with separately but only so for convenience as the two are closely interlocked.

Deterioration of the soil is the major problem which faces farmers throughout the world. The beneficial effects of manuring and resting leys has long been known and utilised in many countries, and the old African custom of shifting cultivation was merely a clumsy way of resting land. The dangers of soil deterioration through erosion and over-cultivation need no emphasis here. It is, then, soil deterioration through over-cultivation which will be the determining factor if we are to have food in plenty. There are two ways of dealing with this problem although much experimentation is required—by the establishment of a proper rotation with periods of rest under grass leys or long term cover crops such as Pigeon Pea and by the use of manure—here we are confronted with an additional problem—in many areas of the Protectorate the cattle population is either scanty or non-existent either because of lack of grazing land or because of the ravages of Tsetse. Artificial manure can only be a palliative, even if they can ever be obtained cheaply enough to be an economic proposition for use by the average African, as they do not affect soil structure. How to improve soil structure without the use of resting leys needs full investigation. We do not know for certain how organic manure affects soil structure; nevertheless the fertilizing effect of manure is fairly definitely established and it is very desirable that stock owners should be encouraged to apply the manure to their plots. The possibility of utilizing small stock, *e.g.* goats as manure and compost makers must be fully investigated as they alone can provide organic manure for those areas where there is insufficient land to permit of adequate rest periods and where there are no cattle. Arising out of this there is yet another problem—how can the manure be got on to the land where cattle exist? The African will, and can, never get it on by head loads as it is far too expensive in man hours. The only practical solution is the ox drawn cart or pack oxen. It cannot be expected that each individual farmer will own carts but there is no reason why a village or group of villages should not have its local carter who would not only use his cart to take manure on to the land but would also take the produce of the community to market.

The foregoing postulates further and full investigation into rotation, resting leys, crumb structure, use of kraal manure and compost, animal husbandry, etc. These investigations need well trained staff and land which are not available at the present time. It is clear that the additional staff set out in the final section of this report is essential if any real progress is to be made. Man power is more valuable than bricks and mortar.

Animal Husbandry.

19. Animal husbandry must be regarded as part and parcel of the Agricultural system. The African still regards his stock as wealth but he does not yet realise how much of this wealth he loses annually in the form of manure so vital to the processes of plant development. He also still is for quantity rather than quality—the greater the number of beasts he possesses the wealthier he appears in the eyes of his neighbours.

Our problem then is to educate the African to realise that by means of his stock he can increase the yields of his crops and that a really good beast is worth more to him than two scrub animals.

20. The stock picture in this country is not a pretty one—large areas are without cattle at all owing to the ravages of Tsetse. If only Tsetse can be controlled there is no reason why a very considerable increase in stock population should not occur. In thickly populated areas the keeping of cattle is limited by the lack of grazing. The possibilities of stall feeding for the production of manure in these areas needs thorough investigation. In other areas where cattle exist there are too many beasts, with consequent over-grazing and soil erosion. Investigation into the carrying capacity of pastures in these areas needs to be undertaken. The general state of the cattle leaves much to be desired—most of them suffer severely from shortage of grazing during the prolonged dry season.

Apart from the general physical condition, the retention of scrub bulls and absence of all control over breeding has resulted in beasts horrible to look at; unsatisfactory from every point of view. Results elsewhere have shown that considerable improvements in native cattle are possible by selection of good breeding bulls and the elimination of scrub bulls by castration. A larger framed beast with good milk records is required and everything possible should be done to improve native herds in this direction without delay. *Pari passu* with better stock must go better management. There can be little doubt that the performance of the cattle as they even are now could be improved very considerably by better management which includes proper herding, grazing control, provision of ample water supplies and supplementary feeding. There is no reason at all why the African should not be educated to appreciate the value of supplementary feeding especially during the dry season.

21. Increased consumption of milk will be another result of better education and it thus becomes all the more important to aim at increasing the milk producing capacity of local herds. At the same time a campaign to improve milking conditions will be necessary if we are to check disease arising from the consumption of unclean milk.

not be overlooked. The proper management of goats and sheep should be investigated with a view to manure production as well as to increasing the local meat and milk supply. There is plenty of scope for extending the keeping of pigs in non-Moslem areas and improved breeding stock is required.

23. The use of resting leys for controlled grazing or for fodder should be examined. Hedging becomes a problem as wire fencing will be out of the question for the average cattle owner.

24. All the points mentioned above show the need for full and early investigation and it is suggested that the basic experimentation on animal management should be conducted at the proposed Tobacco Research Station. For this purpose an Agricultural Officer should be appointed.

General Rural Development.

25. At present the general trend is towards individualistic agriculture and it is to be questioned whether this is desirable in the long term interests of the community.

26. It is difficult to foresee any development of native agriculture other than on peasant lines but there are two alternative ways in which peasant agriculture can exist—the present method with an increasingly individualistic bias or a full development of co-operation and community spirit. It is of interest here to compare the alternatives in Europe—in the Balkans where farming is based on individual peasant cultivation there is a poor struggling community just able to keep its head above water and doing little more than just subsisting; whereas in Denmark, where the co-operative movement is fully developed, agriculture is a peasant industry but a very flourishing and prosperous one.

27. From all points of view the development of a community spirit is to be desired. The general lay-out of village lands, the allocation of areas to their best use, the institution of concerted measures to prevent erosion and soil deterioration and many other agricultural practices can be achieved successfully if instead of dealing with a mass of individuals we can deal with village communities. In connexion with the need for resting leys and across the slope planting the introduction of field strip cropping on a village basis would be of inestimable value. Furthermore it cannot be expected that the African will for long remain content to depend on the hoe for cultivation. In some areas ox drawn ploughs are already used and an increased demand for them can be expected when they are cheaper. Provided ploughing is controlled it is beneficial as it saves labour. Field strip cropping makes it impossible to plough up and down the slope. As there will undoubtedly be an increased demand for ploughs when they become available and are cheaper, it is necessary to ensure that plough owners know the proper use of the plough. It is proposed to establish a small ploughing school at Tiwi for the training of Ploughing Instructors. Looking still further ahead we must expect mechanical cultivation with Tractors to enter into African agriculture. With the present individualistic tendencies such practice could never be economic but with the development of village and larger Agricultural Societies and with the land laid out for communal strip cropping, the use of tractor drawn implements is not at all a hazy vision. It is as well to point out that strip cropping will not be easy to introduce as it cuts across present ideas of tenure; but it is so desirable that it is considered to be well worth while to do everything possible to encourage it. Tractors and implements could be owned by Co-operative Societies and work could be done for the members of the Society for cash payment or payment in kind at the end of the season.

While this development is unlikely to occur in the immediate future in African agriculture, it is most probable that with the ever increasing cost of labour Europeans will be forced to make use of mechanical methods of tillage. Taking both long and short views it is essential that the Agricultural Department should make an early start in investigating the use and effects of mechanical cultivation for both African and European agriculture. It is considered that the proposed Tobacco Research Station would be the most suitable site for conducting such investigations.

28. If it is accepted that the gradual conversion to co-operation is in the best interests of the African it is important that propaganda to this end should be instituted without delay. Whatever else might be possible to achieve by compulsion, it is quite impossible to impose co-operation on unwilling people. The demand for co-operation must come eventually from below and not from above.

29. It has been stated earlier and is repeated here that the programmes of the three major development departments must be closely co-ordinated and more than ever is this essential when the plans are projected into village areas where the objective is a healthy, prosperous, contented and productive community. For this reason alone the suggestions for joint training of staff are strongly supported. The more the agents of the Health, Education and Agricultural departments know of each other's work the more will each be able to help the other.

Education.

30. Under this head we have to consider the child and the adult.

Much play has been made with the term "Rural Bias". The best definition of rural bias is given in the Report of the Committee on Post-War Agricultural Education in England and Wales:—

"It is frequently stated that the education given in rural schools should differ from that in urban schools and have a "rural bias". We understand this means that, wherever practicable, illustrations should be drawn from the life and work of the countryside and from its

natural and physical phenomena: for example, in nature study and science, much of the work should be based on objects commonly to be found and observed in the countryside".

There is such a feeling of urgency in the minds of many people that they consider agriculture should be taught in the very earliest stage of the child's school life. It is thought that as, under present circumstances, so many children leave school at a comparatively early stage they must learn something about farm practices or be for ever condemned to ignorance on these matters. It must, however, be realised that as the system of education improves, the ages of children in the various classes or standards will be gradually reduced and it is likely to be far more damaging to the future of agriculture if matters such as soil conservation are thrust into a small child's mind before he has the basic education to enable him to absorb and understand the basic principle of successful farming.

It is considered that in the early stages natural history should be taught with a view to giving the child a simple understanding of what goes on around him and inculcating in him a sense of beauty and of love for the countryside. For this purpose there may be school gardens but they should be nothing more than field laboratories for the practical side of the natural history lessons.

In the higher stages agriculture can be introduced in the form of rural science and, to complete the picture, Station and Secondary Schools and Teacher Training Centres should be equipped with school farms where the students can be taught all the processes of farming and perform the operations themselves.

31. Before any of the above ideas can be put into practice it is essential that arrangements should be made to ensure that the school teachers are fully capable of giving instruction in natural history and in rural science. Provision has been made in the Rules promulgated under the Education Ordinance for teachers in Rural Science to be appointed to Teacher Training Centres, Secondary and Station Schools. These teachers will have to be trained and additional provision will be necessary at Mpemba and at any additional training centres which may be set up.

Furthermore, courses for teachers already appointed to schools will be required in addition to refresher courses and as a temporary measure it is suggested that the department's experimental station at Likuni should be used for this purpose in addition to Mpemba. Accommodation for 25 teachers at a time will be required and arrangements will have to be made for the temporary secondment of a European Officer to undertake the courses of instruction which, it is presumed, would be confined to school holiday periods.

32. The problem of adult education is a vast one. It can be accepted that the whole field staff of the department is already largely employed on this work but in addition other forms of propaganda are required. The pioneer work done by the travelling military propaganda unit shows a way in which the mass of the population can be reached. A similar unit or units should be set up with more peaceful objectives but it is essential that they should be entirely interdepartmental with a carefully prepared co-ordinated programme of propaganda based on the betterment of rural life generally. For this purpose a separate organisation is required in charge of a specially appointed Public Relations Officer working in very close contact with an interdepartmental committee consisting of the heads of the development departments. This organisation would be responsible for all forms of propaganda, e.g. coloured posters, issue of periodical broadsheets, contributions to the vernacular press, broadcasting, etc., thus ensuring that a balanced picture is presented to the people which they can understand and absorb without being confused and mentally befogged by a spate of uncontrolled and unco-ordinated propaganda.

Economic Crops.

33. The Secretary of State for the Colonies has made it clear that the Colonies themselves cannot expect to be permanently subsidized by the home country and that planning should be so done as to make it reasonably certain that the increase in recurrent expenditure resulting from accelerated development should eventually be met from the revenues of the Colonies themselves. As practically the whole revenue of the Protectorate is derived either directly or indirectly from Agricultural production, it is essential to review with great care the position regarding the cash crops of the Protectorate. One thing certain, is that unless a considerable increase in the value of crops grown for export is obtained it will be impossible to achieve the era of prosperity and social development which every one is awaiting expectantly.

34. Before dealing with particular crops in amplification of the attached memorandum it is as well to consider the broad issues involved in any attempt to increase production. The matter of real fundamental importance is the price paid to the producer for primary produce. There is no doubt that if stability of prices can be assured production of economic crops will increase. Bulk purchasing by the Ministries of Food and Supply during the war enabling fixed prices to be paid to the growers has proved in many cases a great incentive to the producer. It cannot surely be policy to revert to pre-war hazards of marketing where the primary producer was invariably the first and most serious sufferer in periods of slumps and low prices. Given reasonable and stable prices there is no reason why a steady increase in production should not occur.

35. The whole question of the development of economic crops depends largely on the attitude of the African. At the present time the attractions of life outside the Protectorate are such that large numbers of the fittest males emigrate. While this certainly helps to relieve congestion in over-populated areas and also provides invisible exports in the form of the substantial remittances which are sent back to this country, it does not make for stable and cash-earning agriculture.

The problem is to make village life more attractive by the provision of social welfare services and to make the cash return from agricultural pursuits great enough to make a man think twice before he leaves his home. It may even be necessary at some future date to zone the country into economic crop areas and food crop areas, the latter growing sufficient surplus of food to supply the former.

36. Better educational facilities will increase the desire for a higher standard of living and for more and better articles of a general use. The only means of fulfilling this desire will be an increase in income from the sale of agricultural produce.

37. Intimately connected with the development of cash crops are communications. Roads of access to new areas must be regarded as capital investment—the general road system must be laid out so as to ensure accessibility to markets and the orderly evacuation of produce. The present high road transport rates most certainly militate against cheap production and it must not be forgotten that our responsibility is to sell our goods as cheaply as is commensurate with fair and reasonable returns to the producer. The Hot Springs Conference made it clear that if the primary producer is to be safe-guarded so must be the consumer.

38. Railway rates must be related to produce prices and to costs of production. It is obvious that the railway is at present handicapped by lack of bulk travelling over its system. The rates are very high on some crops but it cannot be said that they are hindering crop production at the present time and at present prices, except in the case of cotton, the rate for which is already under consideration by the Railway Authorities. If and when all markets become free the railway rates will assume great importance in the selling of our produce cheaply.

Cotton.

39. A gradual drop in production has been proceeding, partly due to low yields caused by the ravages of the Red Bollworm and partly due to the higher cash return acre for acre obtained from Tobacco. Cotton growing in Nyasaland differs from the Northern territories such as Uganda in that it has to be planted at the same time as, or closely following, the planting of foodcrops. This means that it competes for labour employed on food crop production. At the same time a man and his family could grow a larger acreage of cotton than he can of tobacco as the overall labour requirements are certainly considerably less than of tobacco.

40. The three main cotton growing areas of the Protectorate are widely separated—they are the Lower River area (Port Herald and Chikwawa districts), the Central Province and Karonga.

41. Red Bollworm is the limiting factor, as far as yields per acre is concerned, in the Lower River area. Messrs. Pearson and Mitchell of the Empire Cotton Growing Corporation have made a thorough investigation into possible means of controlling this pest and their recommendations have recently been accepted by Government. If the measures advocated are introduced there is every prospect of increasing yields per acre by at least 50%.

The control of the the River Shire by means of levies would make considerable areas of flood land available which could be planted to rice in the rainy season and to cotton in the winter. This would ensure a very great reduction in Red Bollworm damage which alone would increase yields considerably and it would also enable cotton to be planted as a pure stand giving a still further increase in yield per acre. It is estimated that some 60,000 acres of flood land at least would be made available and this area planted to cotton might be expected to produce 18,000 bales of cotton annually. The maize and sorghum crops would continue to be planted on the non-flood land as at present but no cotton could be permitted on this land as it would create conditions very favourable to serious outbreaks of Red Bollworm.

42. In the Central Province area interest in cotton has been rapidly declining but steps are now being taken to check the decline and to aim at a steady increase in acreage.

43. The main factor in cotton production is the price to the grower. The war-time arrangement made with the Ministry of Supply whereby producer prices were guaranteed has worked extremely well and it would be of the utmost value to the Cotton industry of the Protectorate if some similar long term arrangement could be made after the war. The present production figures are in the neighbourhood of 10,000 bales. The immediate objective should be a figure of 25,000 bales which could be attained if Red Bollworm is controlled in the Lower River and if reasonable expansion takes place in the Central Province.

At present no scheme exists for the proper distribution of new varieties and new seed. It will be necessary to work out a scheme for multiplication from the Empire Cotton Growing Corporation Station to cover the whole Protectorate. This will necessitate the establishment of segregated areas and zones provision for which does not exist in present cotton legislation. Quite apart from the distribution of new varieties it is generally considered desirable to renew seed of existing varieties at definite intervals in order to ensure against deterioration.

44. While improvement in yield by Red Bollworm control and better cultural methods are important, the question of quality is one needing careful consideration. Nyasaland can produce good quality long stapled upland cotton but we cannot face with equanimity the fact that at the present time Nyasaland cotton is at a considerable discount off Uganda cotton and that India does not require any but the good quality roller ginned crop from Karonga. The Empire Cotton Growing Corporation is responsible for cotton breeding in the Protectorate and it can be stated that they have the matter of quality improvement well in hand.

45. If the erection of a spinning mill were to become a live issue, policy as to quality would need review. If the mill spun to coarse counts only, it would be no use supplying it with cotton

capable of being spun to higher counts and high yielding low quality cotton would be preferable. This would probably only affect a comparatively small proportion of the crop and it would be possible to segregate a special area for this purpose.

Tobacco.

46. This is, at present the most valuable export crop of the Protectorate although it appears likely that as the figure of tea production increases that crop will displace tobacco as far as actual value of exports is concerned. But tobacco is likely to remain the chief economic crop for Africans in Nyasaland for many years to come. It is therefore of the greatest importance that everything possible should be done to give stability to this bread and butter crop.

47. (a) FIRE CURED. About half the present crop is grown on the tenant system: the remainder is on Trust Land. It is generally accepted that yields obtained by Africans who are tenants on European owned or leased estates are higher than those obtained on Trust Land. The chief reason for this is the closer supervision which the European and his staff can give to the tenants' crops. Given similar supervision and closer control there is no reason why yields on Native Trust Land should not be as high as those on tenant land provided it is realised that the Tenant Land is, or at any rate was, usually the best land obtainable in the vicinity and that the Tenant does not always have to grow food crops on his land.

In principle there is nothing objectionable to tenant growing of tobacco but there must be provision in leases to compel the lessee to take steps to prevent soil erosion and to maintain fertility.

Tobacco being a "quality" crop it is vitally important that propaganda should be directed towards maintaining and improving quality. Tobacco buyers naturally desire to know within reason what they are going to buy from year to year and we cannot expect them to give us stability unless we do everything possible to give them uniformity. The main causes of complaint regarding quality are narrow leaf, thin leaf and pole-burn. The first two are matters of seed supply and cultural methods, the last is largely a matter of curing accommodation.

48. The most serious problem at the moment is in the Southern Province. A change in methods of topping and priming was introduced some years ago to supply the requirements of the West Coast Trade. Although this change has now been reversed the ordinary grower has not yet reverted to the proper system with the result that the leaf produced is thin and narrow and local prices are affected. There is no doubt that some areas in the Southern Province are not suitable for Tobacco production and alternative cash crops must be sought but there is need for much more intensive propaganda if the Southern Province is to continue as a Tobacco producing area.

49. As regards seed supply a tightening up of legislation is essential to ensure that seed is obtained from approved sources only. This, however, is not the final solution—there must be trial and experimentation with new varieties. No experimental work on Tobacco is being undertaken by the Department at the present time and it is considered essential that a properly equipped and fully staffed research station should be set up without delay. A separate scheme for such a station has been submitted and is attached as an appendix to this report.

50. The problem of curing needs thorough investigation but in the meantime if the incidence of pole-burn is to be reduced the area of tobacco planted by each grower must be reasonably related to the curing accommodation available. European Tobacco planters think in terms of growing so many barns of tobacco a year rather than in terms of acres. The African must be induced to think in similar terms. The use of Kimberley Brick barns is being investigated with a view to saving poles and to the development of communal curing. The pole and fuel position is serious in many areas and extensive planting of communal plots for poles and firewood is required.

The quality factor is so vitally important to the Tobacco industry that the Native Tobacco Board might well consider expending a considerable sum of money to assist in the erection of Kimberley brick barns for the use of the growers.

51. The present position whereby the Native Tobacco Board is responsible for the marketing of the Trust Land crop is satisfactory especially now that the Board has commercial advisers as members. The actual selling of the crop is not satisfactory. Almost all the tenant grown crop is sold privately while all the Trust Land crop has to be sold on the auction floor. This clearly results in uncertainty amongst the buyers as to how much tobacco is available and the solution would be to put all Tobacco over the floor exceptions being made in cases of Tobacco sold on consignment. Even the Auction floor system is not by any means ideal. Very few buyers take part in the sales and to all intents and purposes two buyers (Imperial Tobacco Co. Ltd., and Conforzi) control the prices paid. These two firms between them generally buy over 60% of the Trust Land crop. Fluctuations in prices paid are considerable, e.g. during the 1945 season prices for B grade have varied between 8.9 pence and 14.22 pence. This is obviously most unsatisfactory and would cause considerable dissatisfaction amongst growers if their prices were changed to reflect market trends. The primary producer needs stability more than anything else and the Native Tobacco Board should consider the setting up of a price equalization fund, not to stabilise prices from one season to another but to equalize prices within a season.

Fire Cured Tobacco in Nyasaland, it has been stated, should be able to compete with similar Tobacco anywhere in the world. It has also been stated that consumption in the United Kingdom is unlikely to increase. If we are to increase our production we must look for alternative markets. The West Coast trade is a valuable one but whether or not we can maintain this market in the face of American competition is for further investigation.

52. To sum up. More supervising staff is needed to ensure better attention to cultural practices and to curing; research is urgently needed into all aspects of Tobacco culture; better curing facilities are required; the grower needs protection against violent price fluctuation and investigations into the possibility of alternative markets are necessary in order to allow for gradual and orderly increase in production.

53. FLUE CURED. This industry is an entirely European one and likely to remain so for many years to come. It is, however, not in an altogether healthy state as production has been steadily decreasing for a number of years. The Imperial Tobacco Company has recently given a guarantee to buy approximately 1½ million lbs. of leaf annually with minimum prices for two grades. This is a satisfactory beginning but it is not enough as the Company naturally desires to have some choice in its purchases and wants to see a crop of 3½ to 4 million lbs. instead of the present crop of just over 2 million. The problem is not so much where to grow more tobacco but where to sell it. Expansion of cultivation of this class of tobacco is proceeding elsewhere and there is no reason why this country should not participate in this expansion. If the United Kingdom manufacturers could jointly make a guarantee on the lines of that given by the Imperial Tobacco Company the flue cured producer of this country would be in a reasonably sound position. What he needs is protection against violent fluctuations in prices.

54. If circumstances favour increase in production there is ample room for it in the Central Province and in parts of Mzimba district. There are difficulties to be surmounted if these areas are to be opened up such as water supplies, but there is no doubt that the soil and climate are such as should produce good bright Tobacco.

Before any decision is made in respect of these areas a full scale experiment is required. Details of a scheme for this purpose are given in the appendix.

55. Research is also required for the Flue Cured industry but it is not large enough to warrant a separate scheme. It is hoped, however, that it will be possible to work out some joint scheme which would embrace the Flue Cured industries of Nyasaland and the Fort Jameson area of Northern Rhodesia.

56. AIR CURED. Certain areas considered as the border line for fire cured tobacco may be better suited to the production of air cured leaf. Further research is needed into varieties, cultural practices and curing and provision for such work is included in the Tobacco Research Station scheme.

57. TURKISH. It is extremely doubtful if Turkish Tobacco growing would ever become a native industry. The nursery work and curing is a finicky business and the crop is more suitable as a European one than an African. Considerable extension of Turkish tobacco cultivation has occurred during the war in the Rhodesias largely to supply the needs of America whose normal sources of supply were in the Balkans. Whether or not it will be possible to compete with the Balkans after the war is a moot point but it is understood that Rhodesian growers are not unduly despondent as to the future of their new crop.

58. TUNG OIL. This industry is still in its infancy with little over 8,000 acres planted but there can be no doubt that it offers great possibilities for early and considerable expansion. An estimate of acreage suitable for Tung in the Protectorate reveals that some 160,000 acres could be developed. The aim should be to produce an annual output of at least 10,000 tons of oil.

At present the crop is entirely a European grown one but it is considered that it offers distinct possibilities as an African grown crop if the African can be persuaded to look after a crop which does not mature for 5 years or so. This country lacks a permanent crop for Africans and we have here a possibility which needs full and careful investigation.

59. While development has so far been confined to the South, the most promising large area is in the Vipya Highlands of the Northern Province. Here between 50,000 and 100,000 acres are estimated to be available on land which has never been cultivated and is almost uninhabited. For rapid and successful development, and rapidity is considered to be of great importance, European enterprise must be introduced. It is suggested that half the available area in the Vipya should immediately be leased to a Tung Development Company, the remainder of the area being reserved for future development by Africans should they become interested in the crop. It should be emphasized here that this area is one of steep hillsides and considerable and major anti-erosion works would be essential.

It is proposed that the Company should be formed immediately with Government as a prominent but not dominant shareholder. Government would be represented on the Board of Directors. Provision would be made for participation in the profits by African employees and if, at a later date, Africans themselves wished to develop the area reserved exclusively for them a small scheme on the lines of the Gezira could develop with the Company responsible for major soil conservation works, nurseries, etc.; the African responsible for care, maintenance and harvesting of the crop and the Company responsible for collection, processing and marketing.

The benefits of developing such an industry are inestimable. Apart from the possibilities of employment in the Company the local Africans would benefit considerably by the demand for foodstuffs required to feed the labour. The feeding of the employees of the Company will present difficulties. Yields of maize in the neighbouring areas are not high owing to over-cultivation. There is, however, a large potential rice producing area in the Limpasa Valley which would be well worth while developing.

60. As a parallel development, also in the North, encouragement will be given to planting by Africans in the Henga Valley region where it is estimated some 15,000 acres are suitable for Tung planting. This area is densely populated and probably the best method of approach will be the

planting of a few trees around the homesteads. Collection of the nuts, processing and marketing would be undertaken by the Tung Development Company, cash being paid for the nuts purchased at established market centres.

61. The Tung Research Station will naturally develop with the industry. An experimental expressing plant will be required and if the oil exported is to be standardised as it should be in the interests of our export trade, an Analyst and small laboratory will be essential.

62. TEA. This industry is well established and any expansion is at present controlled by the International Tea Regulation Scheme. The present unlimited demand for tea for export will not be maintained when the East Indies return to production and in the meantime everything should be done to encourage the consumption of tea by the African. There is little doubt that the African is a tea drinker and the returning Askari will have been used to tea as part of their regular army rations. At present the local consumption of tea barely exceeds 100,000 lbs. annually but there is no reason why this should not increase to at least ten times the amount within a few years. A severe handicap to increased tea consumption in Nyasaland is the high price of sugar. The African likes his tea extremely sweet and unless we can give him cheap sugar he will not become a regular tea drinker.

63. The present tea research station at Mlanje has insufficient land for any expansion. Proposals have been made to enlarge the station by the purchase of 500 acres of land adjoining. Furthermore, it is essential that there should be an experimental tea factory capable of dealing with the produce of experimental plots.

The Agricultural Officer in charge of Mlanje should visit Tea Research Stations in India and Ceylon as soon as possible in order to study their methods of Tea Research and to see the Tea Research factories already established.

64. SUGAR. The high cost of sugar (4d. to 5d. per lb.) is responsible for the small local consumption and militates against any substantial increase in tea consumption. At the present time all the sugar is imported from the Sena Sugar Estates of Portuguese East Africa (approximately 1,500 tons annually).

65. There is no doubt that sugar cane will grow successfully in many parts of the country but the high capital cost involved in setting up a sugar refinery with its ancillary activities has probably frightened off many who might have considered establishing an industry. If sugar could be put on the market at between 1½d. to 2d. a lb. there would be a very big increase in local consumption and a corresponding increase in tea consumption. It is not too much to expect that local consumption could reach 10,000 tons in due course.

Suggestions have been made that part of the Palombe Plain could be developed for sugar production and preliminary investigations are being undertaken. Possibilities of irrigation exist in this area and if an expert is obtained to examine the Lower River scheme he should also be able to report on the Palombe Plain area.

66. Apart from the value of the sugar itself the waste products could be utilized for the manufacture of food yeast which would be a very valuable addition to the diet of the African.

67. COFFEE. It may be that the failures which have attended the various attempts to cultivate Coffee in the Protectorate should not be accepted as being so definite that no further truck should be had with this crop. Most of the planting which was done in the past was with Arabica and it is possible that in certain areas of the Protectorate, Robusta might succeed where Arabica has failed. The causes for failure have been variously stated but in general they appear to be due to a combination of the long dry season and insect pests. With Coffee grown under shade and mulched it is worth further trials as a native crop with small homestead plots, and possibly even as a European crop. Trials with Robusta will be started in the near future.

68. OILSEEDS. A steady increase in production of Groundnuts has taken place during the war due in part to the high prices paid at the local markets. Soils and climate of many areas of the Protectorate are peculiarly suited to the crop. At present, yields are low but by closer spacing and with better varieties these could be increased considerably. Quite apart from their value as a cash crop Groundnuts form a very important addition to the food of the people and the increase in area under this crop almost certainly results in an increase in local consumption.

At present prices this country could not possibly compete on the world's market and unless the growers are prepared to accept considerably less than they are at present, Groundnuts must be ruled out as a possible export crop, but a considerable local demand will remain and probably increase.

Very little Sesame (Simsim) is grown at present in Nyasaland but efforts are to be made to encourage production in the Lower River area where conditions are favourable. This would give the growers an alternative cash crop to cotton in addition to providing an additional food crop.

69. If either or both of these crops continue to expand, consideration must be given to the setting up of a Central crushing mill for oil production. There would be a big demand from local stock owners for cake but the question of a market for the Oil would need investigation. The usual objection to a local oilseed crushing industry is the difficulty regarding containers which are expensive to import. An agreement with the Union of South Africa for the supply of oilseeds to their established crushers might in the long run be of greater economic value to this country than the erection of a mill locally.

70. MAIZE. It has often been suggested that maize should be developed as an export crop in this country but there are so many difficulties and objections to such a course that it should no longer be considered as a live issue.

In the first place it is extremely dangerous for a country liable to periodic food shortages to export its staple food. Then maize for export must be graded, dried to a definite moisture content and must be of one type. The local maize crop is a mixture of types and from a nutritional aspect yellow maize is encouraged. For export purposes only white maize is required.

A further point—our two main economic crops (cotton and tobacco) are both erosion permitting and to increase the area under maize would be to increase still further the danger of erosion.

Marketing.

71. As far as marketing of primary produce is concerned the arrangements whereby the Native Tobacco Board controls all markets for Trust Land Tobacco are satisfactory except in one respect. At the present time many of the Agricultural Assistants have to be employed during the whole of the marketing season at the Tobacco Markets. This is most unfortunate as it means that these Officers are kept away from their very important departmental duties for at least three months of the year. It cannot be expected that the Native Tobacco Board should employ a complete and wholtime staff for three months work annually but its European staff requirements should be cut down considerably by employing more Africans. The Kasungu market operated entirely and very efficiently by African staff is proof that this can be done.

72. The pre-war arrangements for Cotton marketing by means of annual auctions of the right to buy at certain markets appears to have worked smoothly and satisfactorily but before this system is reintroduced it will be desirable to investigate alternative methods which might lead to reducing overheads. If the crop increases considerably a system of zoning may be preferable particularly in the interest of preserving the purity of new varieties.

73. The marketing of rice in the major rice growing areas is well organised through the Kota-Kota Rice Society for the Kota-Kota area and by an exclusive licence issued under the Native Marketing Ordinance for the Karonga area.

74. Some tightening up is required in the marketing of beans, groundnuts and maize. As soon as scales are available produce should be bought by weight and prices offered should be displayed at all markets.

It is for consideration whether it would not be more satisfactory for all African grown produce other than Cotton, Tobacco, and Rice in the two areas referred to above, to be purchased by one Produce Marketing Company rather than by a number of small produce dealers as at present. A large Company with strong financial backing would be in a position to open up markets in sub-economic areas and to place produce where it is required. Control over prices paid and over the grading of produce purchased could more easily be attained by such means.

75. The question of export markets must remain undecided until we know what is to be the set up in the post-war world. There is no doubt that countries dependent on primary produce for their economy must be given stability as regards prices and disposal of their produce if they are to develop on sound and progressive lines.

The various agreements made between producers and the Ministries of Supply and Food during the war have had a remarkable effect in giving the primary producer the stability he needs. An assured market with guaranteed prices has enabled him to plan ahead with a feeling of security for the first time in history. If we have to return to the pre-war system of violent price fluctuations with periods of glut and scarcity, the future of Agriculture in the Protectorate is indeed a gloomy one.

Resettlement.

76. The problems of some of the over-crowded areas are very serious and complex. Most of the over-crowding occurs in areas where a large proportion of the population is employed on estates or in townships. Unfortunately but understandably every African desires to retain his holding whether he is working or not. This gives rise to over-crowding and over-cultivation and the aim must be to get these employed people off the land to make room for those who prefer to go in for agricultural pursuits.

Resettlement is often regarded as the cure for all ills of over-crowding on the land. Not only are the administrative problems of large scale shifting of populations immense but ample land for the purpose is required. In fact there are no large undeveloped areas suitable for Africans to which large numbers could be moved.

Small scale resettlement schemes involving small groups of villages should be encouraged but it is essential that the new areas should be carefully laid out beforehand to conform with all the modern ideas of proper land usage. The areas should be model in every respect of what it is considered the whole country should be, e.g. Kimberley brick houses, proper water supplies, demarcation of village grazing areas and village woodlands, laying out the land for strip cropping, provision of village schools, dispensary and meeting hall. No hard and fast rules can be laid down but each scheme should be carefully planned beforehand by the Provincial and District Committees and every effort should be made to influence public opinion so that the whole group will work together as a unit and will adhere to the conditions which are laid down for the regulation of village life.

Staff.

77. The whole success of any plan for Agricultural Development must depend eventually on the provision of ample and well trained staff. It is considered that the training and ability of an Agricultural Officer is frequently wasted by his being cluttered up with routine work most of which

can be done by junior Europeans and eventually by African staff. To make full use of a highly trained Agricultural Officer he should be put on to special projects as far as possible but he would still require to supervise the work of junior Europeans working under him.

78. Apart from the staff required to implement the Land Usage plan and the Tobacco Research Scheme, it is estimated that the minimum requirements for European Staff of the Department to obtain rapid and sound development are as follows:—

<i>Present Staff.</i>	<i>Proposed Staff.</i>
1	1 Director
1	1 Deputy Director
1	1 Entomologist
2	3 Senior Agricultural Officers (1 to each Province)
1	1 Chemist
—	1 Analyst (for Tung)
1	1 Agricultural Officer for Tea
1	2 " " for Tung
1	1 " " for Education
—	1 " " for Animal Husbandry
—	1 " " Northern Province
1	3 " " Central Province
4	4 " " Southern Province
—	1 Plant Breeder for Food crop work
4	4 Senior Agricultural Assistants
8	12 Agricultural Assistants
3	3 Probationary Assistants

No allowance is made in the above estimate for relief staff. If air travel and short tours and leave become general, reliefs will not be required in all cases. Furthermore, the position as regards staff recruitment for many years after the war is likely to be so acute that the luxury of reliefs must be foregone.

79. The attached table summarises the staff requirements. It is obvious that we cannot expect to obtain all the additional staff at once and therefore the estimated cost has been drawn up to provide for two new Agricultural Officers a year for four years and four Assistants a year for three years. Even this rate is probably optimistic but if fulfilled the full staff would be available in 1950 and 1951.

African Staff.

80. The implementation of the plan in Attachment I needs considerable addition to African as well as to European staff. Furthermore it must be accepted that with progress in Education the African will be able to accept more responsible work in the department.

81. The 1946 estimates provide for 301 Instructors of whom 36 have been trained at Makwapala. The present proposals for the Polytechnic only allow for 25 Instructors passing out annually and if a wastage of 10% is allowed the net addition to the staff is only 22 a year. It is realised that until the new Education plan has been in operation for several years the numbers available of standard V and VI men will not permit of any substantial increase in this figure. With the population well concentrated in many areas it might be sufficient to aim at an average of 1 Instructor per 1,000 taxpayers which gives a total requirement of some 500 Instructors for the whole Protectorate over a period of ten years. At the proposed rate of training the figure will not be reached for 20 years at least which is too long. The aim should be to produce 50 trained men a year. The Joint Development Adviser's proposal for three development centres for combined training of rural workers would enable this figure to be trained provided the output from the higher grades of the Primary Schools is sufficient. If, however, it is decided to concentrate all training at Mpemba, provision will be necessary eventually for 100 pupils to be in training at any one time. This will require at least one Agricultural Officer and two European Agricultural Assistants for agricultural instruction alone.

It is considered that a number of returning soldiers will wish to take up agricultural instruction as a career. These men, particularly ex N.C.O.'s, would be very useful despite the fact that their educational standard will be generally below the minimum set for Agricultural Instructors. Proposals are being submitted for the setting up of a temporary training establishment for such men where they would be put through a six to nine months course of rural development generally.

82. There is need also for the highly trained African Agriculturist who would gradually replace the Junior European staff. At present Makerere college graduates are not available to Nyasaland owing to the low standard attained at the Secondary Schools. It is to be hoped, however, that there will be a gradual flow of men going to Makerere or an equivalent institution and available for Agriculture. In view of the time lag and of the five years training at Makerere we cannot hope to obtain a single well trained Nyasaland boy within the next eight to ten years. There will be vacancies for at least thirty in the Agricultural Department, while European estates will doubtless absorb quite a considerable number as assistant managers, etc.

83. The importance of the place of women in African Agriculture is frequently under-estimated. At least they are usually responsible for food crop production and it is through them that much progress could be made. Provision will be required for training women instructors as well as men.

84. It is convenient at this stage to refer to the Development Adviser's proposals for the creation of a common agent for the field work of the Agricultural, Forestry and Veterinary Departments. These are acceptable to this department with the proviso that it may be necessary to extend the present two year course of instruction to three and with the fear expressed that one man serving three or four masters may make for difficult working. If, however, the common agent can be under the direct supervision of the Agricultural Department there should be no confusion and the scheme should work extremely well. The figure given above for the number of instructors required would remain unchanged but the title would be changed from Instructors to Rural Assistants. A certain number of departmental assistants would still be required in connexion with soil conservation projects, experiment station work, etc., but their initial training would be similar to that given to the Rural Assistants.

Special Problems.

85. In addition to the general aspects of Agricultural Development which have already been discussed, there are a number of special problems which may be regarded as requiring *ad hoc* investigation.

86. (1). LOWER RIVER CONTROL. This has been referred to elsewhere in this report and has been dealt with largely from a cotton aspect by Messrs. Pearson and Mitchell in their report on the control of Red Bollworm. Before any steps can be taken to reclaim the valuable flood lands of the Lower River area for general agricultural purposes, a full survey and investigation by an expert in such matters is required. Until his report is available, it is impossible to say whether river control by means of levies or some other measure will be a practicable and economic proposition.

The possibility of using the Lower River for irrigating part of the dry land which now forms the cultivable area of this part of the country should also receive attention by the expert. This might prove in the long run to be cheaper than complete river control.

87. (2). SUGAR PRODUCTION. The possibilities of producing sugar in the Protectorate have been discussed. It is suggested that if an expert is obtained to examine the Lower River area his investigations should include the possibilities of irrigation in the Palombe Plain for large scale sugar production.

88. (3). VIPYA HIGHLANDS, SHORT GRASS COUNTRY. In addition to the area considered suitable for large scale Tung cultivation in the Vipya Highlands, there is a considerable area of high, short grass, downland country which at the present time is entirely unoccupied and unproductive. Much has been written about what might or might not be done in this area but as far as is known nothing has been actually tried there except for small experimental plots of black wattle. If it could be found that sheep or cattle or some crop would flourish in this region another means of opening up would be available.

It is proposed, therefore, that a small investigational farm of some 300 acres should be established in order that every likely crop and livestock should be tried out under close observation. Such a farm should be under the immediate charge of a practical Agricultural Assistant and the investigations should be planned to cover a period of at least five years. The total cost including capital and recurrent expenditure over this period is estimated at approximately £8,340.

VIPYA HIGHLANDS FARM.

CAPITAL EXPENDITURE.

	£
House and Office combined	1,000
Farm Buildings (Store, Cattle byre, Sheep pens)	500
Labour Lines	500
House for Headman	100
Fencing wire, general equipment	500
Water Supply	100
Dipping Tanks for Cattle and Sheep	200
Purchase of Livestock	500
Contingencies	500
	£8,300

RECURRENT.

	Total for 5 years
	£
Salary of Agricultural Assistant	2,100
Salary of Headman	220
Labour	600
Transport and Travelling	500
Maintenance and new equipment	500
Passages	120
	£4,040
TOTAL COST OF SCHEME FOR 5 YEARS	£7,940

Conclusion.

89. It has been stated earlier that no plan for Agricultural Development can possibly be rigid and definite and for this reason this report does not attempt to go into detail as to the various areas which need immediate attention. The Land Usage Report which is attached does designate

certain areas of the Protectorate which need immediate attention as far as soil conservation measures are concerned. As and when additional staff becomes available so will it be possible to implement the various measures set out to improve the standard of farming amongst the Africans in this country. The choice of areas which should receive special attention will be made after full consultation has taken place with District and Provincial Committees. It is suggested that these Committees should select certain portions of their districts for intensive treatment and that an *ad hoc* development scheme would be worked out for the particular need of the area chosen. It would be fatal to lay down hard and fast rules when conditions vary so much from one place to another.

17th August, 1945.

G. W. NYE,
Director of Agriculture.

Summary.

- PARA. 11. A Plant Breeder is urgently required for work on the improvement of African food crops.
- PARA. 13. Investigations needed into food storage problem. While application to local conditions will need trials it is expected that the basic investigations will be done by the East African Agricultural Research Institute.
- PARA. 14. Investigations into Cassava varieties are necessary. Here again the basic work on resistance to disease will be done by the East African Agricultural Research Institute, but there is much work which must be done locally and this would be included in the Plant Breeder's programme.
- The low yields of Cassava in Kota Kota district need early investigation.
- PARA. 18. Shows the need for early and full experimentation into general Agricultural practices with the object of ensuring that the processes of soil erosion and deterioration are checked.
- PARA. 19 24. Summarises the vital need for investigations into Animal Management particularly in connexion with soil fertility. An Agricultural Officer appointed to conduct the basic investigations at the Tobacco Research Station is required.
- PARA. 20. Emphasizes the urgent need for the breeding of better livestock of all kinds.
- PARA. 25 29. The need for the development of community spirit is discussed. The need for propaganda is stressed.
- A ploughing school to train ploughing instructors will be set up at Tiwi.
- Investigations into methods and effects of mechanical cultivation are proposed.
- The introduction of strip cropping is to be accepted policy but difficulties in the execution of this policy must be accepted.
- PARA. 30. Stresses the need for carefully planned agricultural education in schools and proposes the establishment of school farms at Station and Secondary Schools and at Teacher Training Centres.
- PARA. 31. Provision for training Teachers in Rural Science is required for Mpemba and at the same time courses for teachers already appointed are desirable. Accommodation for 25 school teachers at Likuni is required.
- PARA. 32. The need for a Public Relations organisation to co-ordinate and to put out all special propaganda on behalf of the development departments is stated.
- PARA. 33 35. Stability of prices is considered to be essential for the balanced development of economic crop production.
- PARA. 39 45. These paragraphs discuss cotton production.
- Improvement in yields through Red Bollworm control can be effected in the Lower River area.
- The need for improvement in quality is discussed.
- A proper seed distribution scheme must be worked out to multiply new varieties without fear of contamination.
- The immediate objective should be a 25,000 bale crop but that cannot be attained without Red Bollworm control.
- PARA. 46 57. Deals with Tobacco. The need for improvement in cultural practices and particularly for better curing is stressed and additional staff is required.
- A Tobacco Research Station is urgently required for Fire and Air Cured tobacco and a scheme is attached.
- Research on Flue Cured tobacco will, it is to be hoped, be done jointly with Northern Rhodesia.
- PARA. 59. The development of Tung growing on a large scale on the Vipya Highlands through the agency of a Tung Development Company is discussed.

- PARA. 60.** It is intended to encourage small scale Tung planting by Africans in the Henga Valley areas.
- PARA. 61.** An experimental pressing plant, a small laboratory and an Analyst are required for the proper equipment of the Tung Research Station.
- PARA. 62.** Increased local consumption of tea should be possible if cheap sugar were to be available.
- PARA. 63.** An extension to the Tea experiment station is essential and a model tea factory is required to deal with the produce from small experimental plots.
The Agricultural Officer in charge of the Tea Station should visit India and Ceylon as soon as convenient.
- PARA. 64/65.** The possibilities of a Sugar industry are discussed and the advice of an irrigation expert is required.
- PARA. 67.** Further trials of Coffee will be undertaken. Robusta will be tested in certain areas where Arabica has failed.
- PARA. 68/69.** The cultivation of Sesame on an increased scale will be investigated in the Lower River area.
- PARA. 71.** The increasing use of Africans by the Native Tobacco Board is suggested.
- PARA. 74.** A Produce Marketing Company for African produce other than Cotton and Tobacco might be very useful in developing the production of subsidiary economic crops.
- PARA. 77.** The additional staff required to implement Agricultural development plans is set out.
- PARA. 80/81.** The increase in the number of African Instructors necessary is put at 700.
Present proposals for Mpemba need revision in order to turn out a greater number of Agriculturists annually.
- PARA. 82.** African Agricultural Assistants are required as soon as possible.
- PARA. 83.** Women Instructors will eventually be required as well as men.
- PARA. 86.** An expert to advise on measures to control the Shire River in order to reclaim flood land is required.
- PARA. 88.** An investigational farm for the Vipya Highlands is suggested.

APPENDIX 1.

European Staff Requirements.

	Present Establish- ment.	Agricul- tural plan.	Land Usage Scheme.	Tobacco Research Station.	Tung Expt. Station.	Vipya High- lands Scheme.	Full Total Require- ments.	Total Addition to present establish- ment.
Director	1	—	—	—	—	—	1	—
Deputy Director	1	—	—	—	—	—	1	—
Senior Agricultural Officers	2	1	—	1	—	—	4	2
Agricultural Officers	8	5	3	—	—	—	16	8
Entomologist	1	—	—	—	—	—	1	—
Chemist	1	—	—	1	—	—	2	1
Analyst	—	—	—	—	1	—	1	1
Plant Breeder	—	1	—	1	—	—	2	1
Plant Pathologist	—	—	—	1	—	—	1	1
Plant Physiologist	—	—	—	1	—	—	1	1
Senior Agricultural Assistants	4	1	—	—	—	—	5	1
Agricultural Assistants	8	4	12	—	—	1	25	17
Probationary Agricul- tural Assistants	3	—	—	—	—	—	3	—
European Clerks	4	—	1	—	—	—	5	1
Farm Manager	—	—	—	1	—	—	1	1
Surveyors	—	—	2	—	—	—	2	2
Propaganda Officer	—	—	1	—	—	—	1	1
Head Mechanic	—	—	1	—	—	—	1	1
Junior Mechanic	—	—	1	—	—	—	1	1
Soil Conservation Officer	—	—	1	—	—	—	1	1
Asst. Soil Conserva- tion Officer	—	—	1	—	—	—	1	1

Tobacco Research.

The establishment of a Tobacco Research Station for the Protectorate has already been proposed in the Agricultural Development plan submitted by this Department. Arising out of the Joint Development Adviser's visit recently, arrangements were made for joint discussions to take place in Salisbury between Mr. Clay, the Director of Agriculture, Northern Rhodesia, and myself, and the Agricultural authorities in Southern Rhodesia, to explore the possibilities of establishing a Tobacco Research service for the three territories.

Arising out of these discussions it is clear that neither Northern Rhodesia nor Southern Rhodesia is particularly interested in Fire and Air-cured tobacco and that the Trelawney Research Station would not be able to assist in any way in Fire and Air cured research. It is thus apparent that as far as Fire and Air cured tobaccos are concerned we shall have to set up our own research station and it is with this object in mind that I submit the following scheme, which, if approved, might form the subject of an early application for funds to the Colonial Development and Welfare Fund. It is for consideration whether part of the cost of the scheme should not be financed from the local Native Development and Welfare Fund, part of the funds of which have accrued from profits made in the sale of tobacco.

There is no need for me to emphasize here the great and urgent need for a Tobacco Research Station. In the past a certain amount of disjointed and unco-ordinated investigation was made but the fact is that at the present time there are no experiments at all being conducted by this Department on tobacco, a crop, the value of which is greater than that of any other crop produced in the Protectorate, and which is the most important export crop produced by the Africans, (in 1944 the value of Fire and Air cured tobacco exported from the Protectorate was £646,085). The results of any research undertaken would naturally be available to Europeans and Africans alike, but the present scheme does not include Flue cured tobacco which will form the subject of a separate scheme to be submitted later.

I feel that this Research Scheme is of such importance that it should be treated as a separate issue and that steps should be taken to get it going without delay.

The following sets out briefly the requirements of a Tobacco Research Station:—

(1) **SITE.** It is important that the site should be selected in an area typical of a large producing area and also that it should not be remote from some large township; it is never satisfactory for a group of Scientists to work together in a small community without frequent contacts with the outside world. The most suitable area would be near Lilongwe and two possible sites have been provisionally selected. As soon as approval is given to the scheme, it is essential that the sites should be properly surveyed and that the Chemist should make a soil survey to ensure that the soils are reasonably uniform and typical of tobacco growing areas.

(2) **AREA OF THE STATION.** It is of utmost importance to ensure that an ample area is available, not only for experiments to be undertaken immediately, but for future expansion. It has been my experience that the expansion of experimental stations has frequently been hindered through lack of foresight in the original estimate of acreage required. I consider that all aspects of the tobacco crop must be studied together so that it will be necessary to include rotations, and animal husbandry investigations. It will be necessary to have ample supplies of fuel available and indeed investigations into the management and species of timber for tobacco areas would be appropriately included in the station's programme. Ample land will also be essential for housing labour as I hope it will be possible to make the housing conditions on this station model ones in every way. Taking the above points into consideration and making allowance for the normal area of uncultivable land, roads, building areas, etc., it is estimated that between 1,500 and 2,000 acres would be required.

(3) **STAFF.** The minimum staff for such a station would consist of a Senior Officer in charge, Chemist, Plant Breeder, Plant Pathologist, Plant Physiologist and a Farm Manager. The obtaining of this staff will be difficult in view of the demands from all parts of the Colonial Empire for additional technical staff and this makes it all the more important to stake our claim with the least possible delay.

The Senior Officer in charge should be a man of the status of a Senior Agricultural Officer with experience in experimentation and if possible with Tobacco. I would propose that after appointment he would visit the United States of America and Canada to make a study of their Tobacco Research methods so that he would start off with an up-to-date knowledge of the subject.

(4) **WORK TO BE UNDERTAKEN.** All aspects of Fire and Air cured tobacco will be studied and whilst it is impossible to give full details of experiments to be carried out at this stage, the following gives an outline of the work to be undertaken:—

(a) *Plant Breeding.* Comparative tests with existing and imported varieties.

Selection of the most promising varieties and later breeding to obtain increased yields.

Better quality and disease resistance.

New varieties will have to be tested not only at the main station but at selected variety trial centres.

(b) *Field Operations.* Experiments will be laid down to ascertain optimum spacings, methods of priming and topping, the most effective manures, the best proportions and the optimum times of application, etc. Investigations into curing technique may also be included under this head.

(c) *Rotations.* Long term experiments to find out the best rotations for tobacco and for mixed farming will be necessary, including the use of resting leys, cattle manure and green manure in rotations.

(d) *Other matters requiring investigation.* Estimation of factors involved in quality; analysis of soils under various rotations; chemical factors involved in curing; effect of disease on yields and quality; resistance to disease; general studies of plant growth; the general aim to be the production of high yields of good quality tobacco with emphasis on quality before quantity.

I would also include in the programme investigations into mechanical cultivation. We have no information in this country and, in fact, very little information is available anywhere in the tropics, as to the most suitable forms of mechanical cultivation for tropical soils. It would appear to be most likely that increased labour costs will drive European farmers more and more to the use of mechanical cultivation. Furthermore, we must visualise a time, which may be some way off yet, when Africans also will use mechanical means of cultivation. It can hardly be expected that Africans will for ever use the hoe, a most primitive and laborious device, and if Co-operative or Agricultural Societies develop and, as we hope, strip cropping is adopted by African cultivators, then we can expect them to take up mechanical cultivation on a large scale. I feel that it is one of the functions of the Agricultural Department to provide up-to-date information on all aspects of mechanical cultivation.

(5) *GENERAL ORGANISATION.* While I consider that for administrative purposes the station should be under the umbrella of this Department, I would suggest that the programme of work and the annual estimates should be approved by the Native Tobacco Board. Once the programme has been accepted it must be left to the Research staff to carry it out without undue interference.

(6) *COST.* It remains to estimate the cost of such a station. In view of the fact that we are already very much behindhand in experimentation, I trust that a generous view will be taken when the total cost of the scheme is considered. If it is worth doing at all it should be done well. In my estimate I make provision for a full staff so that the total foreseeable cost may be seen.

(a) *Capital Expenditure.*

	£
Laboratory. 4,000 sq.ft. at 10 - including fixtures ...	2,000
Gas Plant ...	150
Houses for European Staff 5 at £1,600	
1 at £1,300	9,300
Houses for African Staff 2 at £100	
7 at £80	760
Labour Lines ...	3,000
Equipment for Laboratories ...	1,200
Tractor, implements and lorry ...	2,000
Stores, barns, etc. ...	500
Cattle, kraal, farm carts, etc. ...	600
Water Supply ...	500
Compensation for disturbance ...	500
Cost of visit to America ...	500
	£21,010

(b) *Recurrent Expenditure. 10 year period.*

	£
Senior Agricultural Officer ...	9,760
Chemist, Plant Breeder, Plant Pathologist and Plant Physiologist ...	29,040
Farm Manager ...	4,180
2 Clerks at £30 by £3 to £45 ...	630
Office boys (2), Night Watchmen (2), Messenger (1) ...	600
Laboratory boys (6) at £18 by £3 to £30 ...	1,260
Tractor driver £4 ...	480
Labour ...	7,500
Transport and Travelling ...	5,000
Upkeep of buildings, new equipment, etc. ...	6,000
Passages (average £200 per officer every two years) ...	6,000
	£70,450

The total cost over a period of ten years will be Capital expenditure £21,010, Recurrent expenditure £70,450—Grand total £91,460.

APPENDIX 3.

Tea Experimental Station, Mlanje.

The present station consists of 75 acres, part of which is unsuitable for tea. It is largely steeply sloping land which makes the lay out of experiments extremely difficult. Additional land is urgently required in order to increase the scope of experimentation and it is proposed that 500 acres of land should be purchased from a neighbouring tea estate. The estimated cost of purchase is £2,000.

A small tea factory is required to enable leaf from experiments to go through the normal processes of manufacture. No estate tea factory can undertake the work. No accurate estimate of cost is possible at this stage and it is suggested that the Agricultural Officer in charge of the Tea Station who will proceed on leave next year should visit firms in the United Kingdom who manufacture tea machinery with a view to obtaining from them an estimate of the cost.

It is proposed that the Agricultural Officer should visit India and Ceylon on his return from leave with a view to studying methods of tea experimentation and manufacture needs at the main Tea Research Stations.

ESTIMATE OF COST.

Purchase of 500 acres at £4	£2,000
Erection of Labour Lines	2,500
Model Tea Factory including power and water—say	20,000
Visit of Agricultural Officer to Ceylon and India—say	500
	<u>£25,000</u>

The recurrent expenditure for labour is not included as it is impossible to estimate at this stage the rate of opening up the new land.

APPENDIX 4.

Tung Experiment Station.

An analyst is required for testing of oil as it is considered essential to ensure that all oil exported conforms to definite standards. A house and small laboratory will be necessary for this officer.

Eventually it may be desirable that the station should be equipped with its own expressing plant.

	<i>Cost over 10 years.</i>
Analyst £400 to £600	4,200
Passages, Transport, etc.	1,500
Erection of Laboratory	1,000
Equipment	400
House for Analyst	1,400
Total cost for 10 years	<u>£8,500</u>

APPENDIX 5.

Flue Cured Experiments in Kasungu Area.

There are areas in the Central and Northern Provinces where soils and climate appear to be favourable to the production of Flue Cured tobacco, and if any extension of Flue Cured tobacco production is to be contemplated it is in these areas that the expansion could take place. There is very little land suitable elsewhere in the Protectorate although given stability and available labour the existing Flue Cured producers in the Southern Province could undoubtedly increase their production considerably. There are, however, difficulties which would have to be surmounted if these areas are to be developed. Water is scarce; food would have to be imported into the areas as the soils are not good enough for the production of maize and other food crops; the tobacco would have to be grown with fertilisers which would be expensive owing to transport costs from rail head; there are no cattle in these areas as it is infested with Tsetse fly; and labour is scarce on the spot but could undoubtedly be obtained from elsewhere.

Before any definite scheme for the development of these new areas can be submitted, it is considered essential that a trial should be made over a period of two to three years. For this purpose it is proposed that a small investigational tobacco farm should be established in a typical area and that trials of varieties, times of transplanting, etc., should be undertaken on a commercial scale so that full reports can be obtained on the final product. In the first place six plots of 10 acres each would be required. It is proposed to station a European on the spot as it is

essential to ensure complete supervision throughout the period of investigation. At a later date it may be desirable to site experimental plots elsewhere in parts of the area which have not as yet been examined owing to inaccessibility.

The estimated cost of the investigation is as follows:—

CAPITAL EXPENDITURE.

	£
Temporary European House	500
Labour Lines	500
7 Curing Barns	400
Bulking Shed, grass roof	60
Grading and Packing Shed, fully equipped	150
Handling Shed	50
Office and Store	100
Steaming Plant	250
Water Supply, Boreholes or Wells, say	200
Opening up of land, including clearing, laying out, nurseries, planting, fertilisers etc. 60 acres at £15	900
	<u>£3,110</u>

RECURRENT EXPENDITURE.

	<i>Total Cost for 3 years.</i>
European Agricultural Assistant	1,260
Transport and travelling	600
60 acres a year for 3 years	1,800
	<u>£3,660</u>
	3,110
	<u>£5,770</u>

There will be a considerable revenue obtained from the sale of the tobacco produced which will off-set most of the recurrent expenditure.

ANNEXURE II—ATTACHMENT I

POST-WAR DEVELOPMENT—AGRICULTURE.

PART I.

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SUMMARY OF REPORT.

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APPENDIX: B. Estimates of cost of the Proposed Tobacco Research Station (Page 128 of the Report)

In a country such as Nyasaland, whose existence and economy are so closely bound up with the land, it goes without saying that agricultural development is a process of first importance. In planning for its post-war continuation there appear to be three main objectives, closely inter-related but which may nevertheless be more conveniently examined separately; they are:—

- I. The conservation of soil, soil fertility and natural resources.
- II. The production of ample good food for all.
- III. The increased and more economical production of cash crops.

PART I.

The Conservation of Soil and Soil Fertility.

Logically this objective must receive priority consideration since the other two are largely dependent upon it. To plan for an ample and nutritious food supply and to foster increased economic production for a rapidly expanding population without first securing the resources which make each a possibility is untenable; but even at the present comparatively low level of production the continuous ebb of soil fertility and soil itself is sufficient to cause the gravest alarm. The present picture is one of a swiftly growing population, blind to the future, consuming and exporting the dwindling resources of its land with scarcely a thought for their conservation and repair and, as yet, with little incentive to impel them to do otherwise. Moreover, the executive system is not yet geared to cope with this situation as an urgent problem and to prevent it from deteriorating still further. The efficient and conservative use of the Protectorate's land is not solely a matter for solution by the Departments most intimately connected with it, but is a subject of such magnitude and wide implications that the rigid guidance of a far-sighted Government directive is urgently needed.

A. A PROTECTORATE LAND USAGE POLICY.

This, then, is the first requisite and one which is at present lacking. Generally speaking no lands in active use in the Protectorate are submitted to any objective planning beforehand and much of the deterioration at present in progress arises from, or at least is aggravated by, utilising land for purposes to which it is not suited. The extent to which such a practice may increase as the population expands makes it highly desirable that some provision should be made to enable arable, forest, grazing etc., in the permanent interests of the community dependent upon it. Upon this basis the subsequent management of each category of land would be greatly simplified; but it is suggested that the degree to which compulsory measures should be applied to enforce its conservation in the interests of posterity should be considered and included in a statement of policy.

The complex subjects of immigration and local movement of population within the Protectorate have a profound influence on land usage, imposing unpredictable strains on the land in areas affected, and plans should make provision for the control of such movement. Similarly, organised resettlement to relieve congestion needs consideration as a matter of principle since it is arguable that the redistribution of an overcrowded populace is harmful in that it eases the sense of present urgency which is a valuable incentive to tackle the conditions which will ultimately have to be faced throughout the country.

Allied to the question of settlement and movement is the system of native land tenure which is to be fostered as part of Government's land policy, so that the evils which have followed uncontrolled evolution of system of tenure in other countries may be avoided.

Destocking and the limitation of cattle population are matters of considerable importance and political complexity which may also demand attention in certain areas in the near future. In other areas, on the other hand, more cattle will ultimately be required for mixed farming.

Likewise the policy to be pursued for the control and ultimate eviction of tsetse fly is one which requires planning in close co-ordination with other land matters, notably settlement and forest management.

Finally, of the major factors for incorporation in a general land policy, that of the further alienation of land for non-native occupation is one that requires early review. Despite the growing pressure of native needs it should be appreciated that there are areas, particularly in the Northern Province, wherein unenlightened and uncontrolled cultivation would be particularly harmful and where European guidance, official or otherwise as may be decided, is a "*sine qua non*" before development can proceed.

To formulate a Protectorate Land Usage Policy which might safely be adopted as a long term guide on this vital subject, would be virtually impossible with the present lack of information. It is for this reason that a detailed discussion of these important subjects has not been attempted and that a recommendation has been submitted to Government for a survey to be made at an early date to collect and collate into a local 'Doomsday Book' all the 'data' concerning the land which are needed to plan its use and conservation with the utmost efficiency.

B. MACHINERY FOR THE PROPER IMPLEMENTATION OF THE LAND POLICY.

This is the next essential, and it is scarcely less important than the policy itself. It is suggested, therefore, that one of the functions of the Survey should be to make proposals regarding the machinery for translating the policy into practice, so that the attitude of the survey to its task may remain essentially practical.

It is considered that all the following subjects are essential cogs in the machinery:—

(1) *District Land Usage Plans.*

Each district, as the permanent administrative unit, should have its land usage plan framed in accordance with the broad policy of the Protectorate. The Survey would not, of course, recommend to Government the details of the plan but would indicate the principal features involved, and the task of preparing it in detail would devolve upon the administrative and departmental officers working in each district.

It may be noted here, for the sake of crystallising ideas and in an endeavour to secure a foundation for continuity of subsequent aim, that officers of the Department of Agriculture have already been instructed to draw up district land usage plans in the light of present facts and policy and in co-operation with other officers concerned. Moreover, at the instigation of the Secretary of State, a comprehensive Soil Conservation Scheme for the Protectorate has been prepared and it is suggested that that scheme should be considered in conjunction with this memorandum.

(2) *Comprehensive Land Usage Legislation.*

It should not be supposed that the Department of Agriculture entertains any liking for compulsion for compulsion's sake, or that it advocates recourse to legislation merely to facilitate its routine tasks. It is readily admitted that the steady progress of education and instruction to engender self-help are the ideal developmental processes which should be pursued whenever possible, but it is felt that there is a particular urgency in the matter of soil conservation which will not brook delay, and that more drastic measures are necessary and amply justified. Soil erosion has been described as "the greatest physical danger to mankind". Particularly is this so where the population is blind to its progress and implications, and therefore lacking the incentive to check it. It is feared that if education and instruction are alone to be relied upon to awaken a realisation of this evil and to instigate active counter-measures, land exhaustion will continue to gain upon conservation until it is too late and the soil will cease to support its growing population. It is submitted that the conclusion is inevitable that it is necessary to be cruel to be kind and that the compulsion of a minimum of conservation measures is essential for the thorough execution of land usage plans in the common interest.

Hitherto such orders as have been made for the controlled management of Native Trust Land have, with the notable exception of certain rules under the Forest Ordinance, been made by Native Authorities. Generally these Orders have not been found very effective principally because the Chiefs have themselves not fully appreciated their necessity and also because they naturally feel reluctant to enforce new measures which are unpopular and which will thereby incur the disfavour of their people. This attitude of the Chiefs towards drastic measures of land control and management is unlikely to undergo any radical change in time to prevent irreplaceable losses of soil, and it is for this reason that the enactment by Government of comprehensive land usage legislation is strongly advocated as a fairer and more effective instrument for the purpose. The only outstanding case of successful execution of Native Authority land Orders was in the Misuku Hills of North Nyasa where, by persistent and personal intervention, the officers on the spot insisted on obedience to the Orders which they themselves had recommended to the Native Authority. Thus was an area in imminent danger of soil exhaustion, saved for its now satisfied occupants and their descendants.

Interference by Government to ensure adequate soil conservation on alienated land is unfortunately also necessary. On many estates measures for soil protection have been even less effectively adopted than on Native Trust Land, and the danger of erosion is increased because of the greater force acquired by storm water collected on the larger blocks of cleared land. The covenants of many of the older leases laid no emphasis on the proper use of the land, rather was the intention to stimulate its economic development, there being then no fear that this might degenerate into exploitation. Recommendations for the revision of covenants are already under consideration by this Department and the Conservator of Forests; and it is to be hoped that the projected Natural Resources Bill will give Government the control which it should rightly possess as landlord of the country's greatest, but depreciating, asset.

If legislation is introduced to provide for certain conservation practices on alienated land it will of course be necessary to ensure that the stipulated requirements are observed. It would thus be essential to appoint an officer for this specific duty since the task would be onerous and not always agreeable, and one which, if combined with other duties, might tend to be shelved. It is suggested that the officer performing this duty should be an Inspector appointed to the Lands Department for the purpose, and not a member of the Department of Agriculture, wherein it would be invidious to attempt to combine the functions of Adviser and Invigilator on European property.

(3) *Increased European Supervision.*

If the measures which have been recommended are to be carried out in a determined manner, and proper effect given to the legislation designed to assist them, substantial increases in both technical and administrative staffs will be necessary so that instruction and vigilance which is not only necessary to achieve progress and, at the same time, to offset any tendency there might be for political repercussions, but which is the just due of the largely ignorant. It must not be overlooked that the development plans herein discussed have not been conceived as a gentle stepping-up of effort, but as an intensive drive to "put the house in order" before it is too late to do so. The process will be expensive but it is safe to say that every pound spent now will save ten in the future, required in a belated effort to repair far greater damage and in the perpetual relief of food shortage among a population four or five times its present size, struggling to survive on land long since unable to support it.

With the present staff of the Department of Agriculture there are still many large and important areas of settlement which are very seldom visited either because it has been impossible to spare an officer to be stationed in the vicinity, or because of pre-occupation with the production and marketing of tobacco or some other crop demanding concentrated attention. Post-war conditions are likely to insist upon still greater efficiency in the production of economic crops, and it is highly unlikely that supervision in that direction can become less intense. Moreover, it is to be hoped that facilities for making a livelihood from the land will be greatly extended; and it is easy to see that, if the closer attention which this would demand is to be added to the task of tackling land conservation as a race against time, a large and skilled staff of the department would become essential. The minimum permanent establishment which would be needed, the stations and approximate areas of activity, are shown in Appendix A. Needless to say such measures as have been envisaged in the foregoing pages of this memorandum would require the most active assistance of the District Administration in the field, and it might well be that a corresponding strengthening of its ranks would also be necessary.

Attached to Appendix A is the estimated cost, both capital and recurrent, of the additional staff considered to be necessary. It will be noticed that in the Schedule no provision is made for the eventual employment of African Agricultural Assistants to replace Europeans, although this is the accepted policy whenever circumstances permit. The omission is deliberate for the reason that it is as yet impossible to forecast the time at which Africans with the required educational and technical training will become available but it should be understood that the estimates of cost as now presented will be progressively reduced as and when it becomes possible to fill the subordinate (European) appointments by Africans.

It should also be mentioned that the staff recommended above for the Department of Agriculture does not include provision for any specific projects for the development of Animal Husbandry, which might become the responsibility of the Department if the recommendations of the Post-War Development Committee were implemented (Interim Report No. 4 para. IV).

(4) *General Education of the African Population.*

The need for education in the general sense is well recognised and is in the forefront of the great majority of Colonial Development projects; but, in Nyasaland at any rate, this subject has not yet been related to the land—that most vital part of the African's environment which he must learn to control. As has been mentioned already the Nyasaland African usually lacks any real incentive to impel him towards a deeper and more personal interest in his land. Those for whom money is the strongest attraction emigrate; for the remainder the incentive to make their land a permanent source of abundance and wealth is very strictly limited. It is common experience all over the country to encounter cultivators of cash crops who, once they have secured a reasonable sum of money, blatantly neglect elementary practices, well within their scope, which would have increased their total earnings substantially.

Money is a limited incentive, and pride of achievement—as far as agriculture is concerned at any rate—is tempered by the fear of jealousy and of consequent super-natural sanctions. Where there is no response to an available or adaptable incentive recourse must be had to education to induce it. The people must be taught to grapple with their environment, not to escape from it, and the responsibility of education in regard to land usage is of such immense importance that it is dealt with specifically at length in a separate memorandum, wherein recommendations are made for school instruction under the comprehensive title of Rural Science.

(5) *Propaganda.*

Education in Rural Science is of necessity a long-term factor and it can be of only limited assistance in the critical period of the immediate future. It can, however, be prefaced and supplemented by propaganda, which has considerable and quicker possibilities, as yet virtually untried in Nyasaland. Apart from its direct value towards the objective under discussion, propaganda might almost be regarded as an essential precaution against any tendency there might be to political resistance to the more unpopular of the measures envisaged.

To be successful propaganda must be objective, consistent and vital, and it must be expertly directed. There are many forms suitable for local use: posters, pamphlets and books being among the more obvious, differentially designed to appeal to the educated and uneducated alike. The value of films for propaganda and instructional purposes among Africans is now established from experience with "askari" and the mobile cinema and broadcasting offer endless scope for post war years; but it should be carefully considered whether educational films produced in other countries will have any useful appeal or create any definite impression of personal practicability amongst the local population viewing them. There is a very strong case not only for a cinema organisation in Nyasaland, but for a film-producing unit as well.

In view of the infinite possibilities and highly specialized technique of propaganda it is a matter that should be handled expertly and deserving of intensive support. It will readily be discerned moreover, that the subjects which require attention are so allied and interlocked that it cannot rightly be placed under the control of any single interest or Department. It is suggested therefore, that the Propaganda Officer should be the executive Officer of a body composed of representatives of the Departments most closely concerned with the social welfare and economic development of the African. Finally it will probably be agreed that propaganda should be designed

(6) *Control of Immigration and Local Movement of Population.*

The facts of rapidly increasing population and rapidly declining soil fertility have already been sufficiently emphasized to make it clear that the country's capacity for supporting its own people is under an increasing strain. Study of a population map of Nyasaland and adjoining territories shows that the population density is already far greater in this country than in any of its neighbours and the danger of increasing it by immigration, even in districts as yet unsaturated, are obvious and have long been realised. Although some control on immigrants is exercised by the Native Authority, the latter has not always the proper appreciation of the future of his land to guide him, or the executive ability to carry out such desire as he may have to prevent or to limit the evil. There are various means of circumventing the regulations, and it appears that, as in so many urgent matters of this nature affecting the land, if the problem is to be dealt with quickly and effectively it needs closer intervention on the part of the District Administration—a measure at present impracticable.

The question of the control of movement of villages and groups of individuals within Nyasaland arises from a somewhat different purpose. At present the natural native tendency is to pursue, so long as it is at all possible, the old system of shifting agriculture and unrestricted movement. When the fertility of one area is exhausted subsistence must be derived from another, and from force of circumstances movement is directed more and more towards marginal land through which an African cultivator moves with his unenlightened methods at alarming speed. There is therefore a double danger in uncontrolled local movement: not only does it allow encroachment, often unnoticed at the time, into land which should not be brought into cultivation, but the very fact that movement is unhindered prevents the development of a sense of urgency to control environment which might otherwise be acquired more quickly. If the ultimate Land Usage Policy discussed earlier in this memorandum provides for the planned allocation of land to various uses on a permanent or semi-permanent basis, unauthorised settlement in unsuitable areas would be prevented; but active intervention by Native Authorities to restrain movement at its inception would be essential and a check on new clearings by District staffs on tour would doubtless also be necessary.

(7) *Experimental Work on the Maintenance of Soil Fertility.*

Soil erosion is the almost inevitable successor to soil exhaustion. To a large extent it can be limited by physical means, despite continued decrease in soil fertility whereby the productive capacity of the soil is progressively reduced. The old method of restoring fertility by abandoning tired land to rest under bush was effective and essentially sound, but the arrest of shifting cultivation and the greater density of population has made it virtually impossible in some districts to afford the land the periodic rest it needs, with the result that the capital fertility of the country is being tapped without replacement. It is therefore a matter of great importance to evolve and introduce a system which makes efficient and productive use of the land whilst maintaining its fertility. Hitherto it has been generally expected that 'good farming', including the use of manure, compost, green-manures, rotations, etc., would eventually come to the rescue and would constitute a permanent system of agriculture in which the fertility of the land is either maintained or improved. Recent research in Uganda has, however, shown that this may not be the case, since on certain of their soils at least it has been proved that all the established practices of 'good farming', in the accepted sense, are inadequate, and that periods of absolute rest under fallow are essential at intervals under certain tropical conditions. Here then is an issue of some moment in land usage: it may prove necessary for every cultivator to have sufficient land to permit a part of it to be fallow, although this would not absolve him from the necessity of stepping-up the efficiency of production during the cropping cycle. At the recent East African Agriculture Research Committee meeting in Nairobi the fundamental importance of this issue was emphasized, and long-range research into the general subject of maintenance of soil fertility will occupy a prominent part in the programme of the new Research Institute. Four experiments have been designed to investigate the problem in this country, and close liaison is being kept with Amani, to whom copies of our experimental layouts have been sent. Briefly these may be summarised as an examination of the recuperative effect of different types and durations of fallows applicable to native economy, and the degree to which fallow can be replaced by continuous cultivation embodying 'good farming' methods. Within the latter category there are of course many other practices influencing the maintenance of land which need thorough examination. Of these, one is the most advantageous treatment of crop residues: whether they should be burnt or incorporated in the soil. Another of wide importance is inter-planting and mixed-cropping. It is unfortunate that the three main crops grown in Nyasaland, maize, tobacco and cotton, are all wide-spaced and for that reason predisposing to maximum soil erosion, as proved by experiment in America. Inter-cropping has in principle the dual benefit of providing extra protective cover for the soil and, with adjusted spacing, increased production per unit area. Intercropping also assumes added value in such countries as Nyasaland, throughout most of which 75% or more of the cultivated land is under maize. This state of affairs makes a balanced rotation of crops out of the question until food preferences and prejudices alter considerably.

These and other allied problems are to receive early attention on experimental stations in this country as soon as the staff situation permits; and they are likewise to be included in the East African Agricultural Research service programme as long-term investigations when the new station is established.

Livestock, which in advanced-farming communities are the key to the maintenance of soil fertility, do more harm than good in certain areas of Native Territory.

exist it is considered to be a matter of urgency that whatever steps are necessary in the way of water supplies, tsetse eradication and the establishment of pastures, etc., to enable mixed farming to be practised over a much larger proportion of the Protectorate, be taken at the earliest opportunity. It cannot be over emphasized that the continued divorce of stock-keeping from the other branches of land use and management perpetuates a wholly inefficient system of farming such as is incompatible with planned development and the maintenance of fertility. Particularly in view of the high population density in certain parts of the Protectorate the proposal to extend the cattle industry is clearly one of very great complexity but the difficulties must be surmounted if it is conceded that permanent agriculture without stock is a doomed enterprise under modern conditions.

With these ends in view the appointment of a Pasture Officer has been recommended in the Post-war Land Usage Scheme already referred to. It is, however, a pre-requisite to any livestock development plans that a thorough survey be made of the pastures of the country and their component grasses, so that the conditions and resources pertaining may be thoroughly appreciated.

Not only may it be necessary to devote attention to the improvement of bush pastures (a process which may involve the large-scale eradication of bush and scrub), but also in densely populated districts the garden fallows will have to be made to serve the dual purpose of soil recuperation and the provision of good grazing.

C. THE MAINTENANCE OF THE MACHINERY FOR IMPLEMENTING THE LAND POLICY.

The formulation of a land usage policy has been discussed, followed by the machinery by which it could be implemented. The maintenance of all that would have been planned and done should not prove particularly difficult provided that the guiding policy is definite and clear, and the machinery soundly constructed. The management of land on a large scale does, however, call for considerable executive ability and the most vulnerable period would be when, after the emergency interregnum of more direct action, the responsibility begins again to revert to the Native Administration. It is to be hoped that education and propaganda will by that time have begun to form in the public mind an appreciation of the reasons and benefits of the improved measures which the people would have been obliged to adopt, but there will still be a definite need for executive action.

In all soil conservation and land matters there are inevitably works and boundaries which are of importance to the community rather than to any particular individual members, and it is reasonable to suppose that the community should maintain them. Such a suggestion is at present foreign to native conception in this country but if it is not pursued, not only would the State be involved in a considerable expense in undertaking the work itself, but the development of a communal sense of responsibility towards the land would be still further weakened. In the event of a decision being taken to entrust this maintenance work to the community, legal provision therefor would have to be included in the general land usage legislation.

Maps play an invaluable part in planning land usage work, but they are of equal importance in its maintenance as a record of what has been planned and accepted as a permanent requirement. Without such a record instability and confusion are almost inevitable with the frequent changes of district staffs which take place; and the continuous drive at specific planned objectives, which is so necessary, would be made much more difficult in consequence.

Accurate and comprehensive maps are equally required for so many other aspects of development and administration that the case for them need not be further emphasized here.

It is to be hoped that it will be found possible for air and triangulation surveys of the Protectorate to be undertaken in the not too distant future.

PART II.

The Production of Ample Good Food for All.

This is an important part of the national task of any country. For convenience of discussion the subject may be divided here into Quantity and Quality of Food.

A. SUFFICIENT QUANTITY OF FOOD.

Dr. Platt, who conducted an investigation into human nutrition in Nyasaland in 1938-39, arrived at the general conclusion that, save in a few specific respects and at certain seasons, the average native diet was more commonly deficient in quantity than in quality. The provision of sufficient food is therefore the first consideration, and it is, somewhat obviously, dependent primarily on the maintenance of the fertility of the soil which has to produce it. The subject fully discussed in Part I may therefore be regarded as the principal instrument of policy towards an ample food supply, and may be called the basis of good husbandry.

Despite the best of methods the most assiduous cultivator is always liable to be defeated by the weather and other factors beyond his control, but there are many means described below by which the security of his food crops may be increased and their yields augmented.

(1) Early preparation of gardens.

elementary cultural practice is almost universally neglected is the result of ignorance, idleness and lack of incentive. Sufficient food has generally been secured in the past by the easier course of awaiting the softening of the ground by the first rains before beginning to dig; but the soil is not quite so bountiful as it was, and more timely preparation is now necessary to augment the chances of success. Native Authorities of the Northern and Central Provinces have introduced Orders to hasten preliminary cultivation, but this is not an easy subject in which to see that Orders are executed and the backing of education and propaganda is wholly needed in support.

(2) *The use of Reserve Crops.*

The wider and wiser use of 'stand-by' or reserve crops is another means by which food supply may be made more secure. The more extensive use of cassava has frequently been advocated as a hardy and perennial plant giving a heavy yield, but it is open to the objection that it is far from perfect dietetically. Moreover, like all crops which are in the ground during the dry season, it is liable to severe damage by unherded cattle. Although not immune to this latter danger, sweet potato is more nutritious than cassava and might be of great value as a reserve crop in that it is planted late in the rains at a time when the outcome of the maize crop can be foreseen and potato plantings gauged accordingly. Certain pulses and short-term cereals, which can also be sown in an emergency late in the rains, are similarly useful as reserve food crops. Yams, which possess better keeping qualities than other roots, should not be overlooked.

(3) *Dry Season Cultivation.*

The uncertainty of food supplies may be still further overcome by the cultivation of moist valley-bottoms in the dry season and, eventually, by means of irrigation. The normally high fertility of the soil in valley floors endows them with great potentialities, and their proper use is to be encouraged, but particular care is needed in the process. Moist valleys commonly possess a vegetative sponge, which not only holds valuable supplies of moisture, but also constitutes a 'buffer' to flood water concentrated from the hills into the valley, without which serious erosion might result. If this sponge is broken up in cultivation it is essential that artificial barriers be provided to cope with storm-water and that the stream banks be very adequately protected with vegetation. Experimental work is needed to determine the safest and most productive means of utilising these fertile potential sources of increased out-of-season food. Enquiry is also needed in regard to the utilisation of the other type of valley floor which has the merit of moisture supply, but is for reasons of soil unsuitable for cropping in its present state. But, as has been already mentioned, the intending cultivator needs more certain protection for his dry-season crops from unherded cattle than now exists. The civil redress against the cattle owners, to which the cultivator is at present entitled, is not generally sought on account of the important social status of the cattle owners.

(4) *The stimulus of a Cash Market for Food Crops.*

The development of a food crop as a cash proposition is definitely a stimulus to its greater consumption, provided that undue encouragement for its sale is avoided. Suggestions for the development of certain crops of particular value to the dietary, by means of guaranteed minimum prices, are contained in Part III of this memorandum.

(5) *The more efficient use and distribution of labour.*

Many of the recommendations contained in the earlier part of this section and also in Part I above, will involve increased physical effort for which the average African is neither inclined nor physically equipped. His present practice is to concentrate the bulk of his agricultural activities into the rainy season, the earlier months in particular, and to enjoy comparative rest in the remainder of the year—a rest which is frequently necessary to restore his health, which has suffered under the strain of the busy season. The imposition of any further work upon him must be accompanied by a re-distribution of effort and a flattening of the labour 'peak' in the busy season. The suggestions contained in paras. (a), (b) and (c) above have this effect: the earlier preparation of gardens brings forward work now entirely confined to the early rains; greater reliance on reserve crops which are planted late in the rains likewise postpones other effort, and the development of dry season cropping would greatly reduce the burden of work in the rains.

In consideration of the manual effort required in native agriculture, particular regard must be paid to the part played by women, increased as it is by male emigration. It was computed by the Nutrition Unit that in addition to field work the native woman spends an average of some two hours per day in pounding maize in the preparation of food. Clearly it is very necessary to reduce this burden if women are to find time and energy for much-needed reform and improvement, and the introduction of maize mills is a means by which this may be done. The gradual establishment is visualized of a series of centrally-sited power-driven mills, owned preferably by Native Authorities, which will enable the household to get at least part of its grinding done with the expenditure of no more energy and time than occupied in walking to the mill. Payment could be made by option in cash or in kind, receipts in the latter form being stored in bulk against periods of shortage. Initially some prejudice would exist against whole-meal flour but there is ample evidence that this would decline, with the advantages accruing that a more nutritious and economical article of food would be eaten and a greater weight of consumable food be harvested from each acre. (In years of plenty as much as 15%-20% of the maize bran and husk is thrown away with the present methods of preparation of flour). Thus the introduction of mills would save time for more profitable work, provide more energising food for its execution, make less demand on the land and facilitate control of the land.

A further means by which time and effort may be saved is in the use of better tillage implements drawn by oxen. These, admittedly have their drawbacks and dangers, but on flat land, their introduction should be wholly beneficial and might be fostered by a system of collective ownership and use. As a start ploughs might be purchased by the Native Administration or the Agricultural Department and hired out to surrounding cultivators for a small fee; particularly might this be started with every prospect of success in the flat lake plains of North Nyasa where ploughing is already practised to a small extent and where there would be little danger of resultant erosion.

(6) *Better Storage of Food Crops.*

It is of little use to produce more food if it cannot be stored until required by the consumer. Since the vast majority of the latter produce their own requirements it is the storage system employed by the individual cultivator which is of greatest importance. In this respect it is not his methods of storage which are so much at fault as his improvidence and apparent unconcern with future security. The rectification of these defects will be the outcome of painful experience and education; but at the same time patient instruction and demonstration of improved grain stores should be continued. Very satisfactory types can be evolved with little trouble from stores now in common use. It is debatable whether any direct effort should be made by Government to form large-scale bulk food stores to meet local shortages, particularly if the suggestion in the penultimate preceding paragraph regarding storage centres to be organised in conjunction with central grain milling plants were to be adopted. Administratively Government reserves would greatly facilitate the handling of famines and other urgent demands; but should such stocks of food exist there would be a natural tendency to regard them as freely available reservoirs to satisfy cases of even minor need, thereby removing from the individual native cultivator a sense of urgent responsibility for his own food security.

The ideal system of storage would presumably be individual effort backed by small central reserves contributed voluntarily by the community, and this should receive encouragement. But the present tendency is a progressive disintegration of community spirit and effort, and communal storage can best be effected through the medium of the maize mills discussed in the foregoing section. By this means the people would receive a service, in the form of milling, for which they would contribute in payment a quota of maize for storage.

There is a great need for fuller investigation into the whole subject of native storage methods from the aspect of pest control. The importance of this subject has been recognised by the East African Agricultural Research Committee which recently suggested that the Entomological staff of the Research Institute should give it their early attention, whenever the staff situation allows.

Allied to unsatisfactory storage of food reserves is the common native tendency to keep insufficient seed to ensure a full scale planting and supplying for the following season. This again is chiefly the result of an improvident outlook, which not infrequently is a cause of inadequate supplies of the minor food crops particularly, but which can only be overcome by experience and the gradual acquisition of a more enlightened attitude generally.

(7) *The Introduction, Multiplication and Issue of Higher-Yielding Varieties.*

The evolution of improved strains of food crops by plant breeding, in its full sense, is to elaborate a process to be undertaken in this country, which has, however, satisfactory access to the material produced at Amani and in the larger East African territories equipped to undertake work of this nature.

With one important exception, dealt with in Part III of this report, experimental work on the major economic crops of the Protectorate is, and can continue to be, handled adequately on the stations specifically provided for the purpose, and it is intended that, when the staff position improves after the war, the remaining departmental stations shall concentrate primarily on food crops.

The policy to be pursued should firstly be local selection and secondly, the acquisition from other territories of planting material of all promising crops and to test them under local conditions against those in general use already. Much work of this nature has been done in the past, but with the ever-expanding range of new varieties and types evolved elsewhere the work required in the examination for local suitability increases similarly and continuously.

The chain of issue of varieties of proved worth should be through the medium of Native Administration Seed Farms, on which suitable material is bulked for issue to cultivators. The function of initial experiment is properly undertaken by Government on its experimental stations and the task and expense of bulking is done as a service for the people, at a number of farms to whom all have access, by the Native Administration. This latter stage of the organisation has only recently been begun, but it can be extended without much difficulty with the increased staff recommended in Appendix A and by relatively small grants from Native Treasuries or the Native Welfare and Development Fund, for the institution and maintenance of the seed farms.

(8) *The Reduction and Elimination of Plant Pests and Diseases.*

This is frequently an important objective of plant-breeding briefly discussed above, and much of the long-range breeding work at the East African Agricultural Research Institute is, and will continue to be, connected with the evolution of crop varieties immune or resistant to serious pests or diseases. The work on virus-resistance in Cassava is an example. As far as this Protectorate is concerned, however, the Department will be chiefly interested in testing and observing the relative susceptibility of introduced and local varieties, and in the reduction of damage by improvements in cultural methods and field hygiene.

(9) Improved Cultural Practices.

There is no doubt whatever that very useful increases in yield would result from relatively simple modifications and improvements in current native practices. Those with specific influence on the maintenance of fertility were mentioned in Part I (para. (7)), and the most important factor of timely preparation and planting has already been emphasized in this Part. The improvement in organisation of operations and labour which this latter point implies would greatly facilitate weeding, the neglect of which is at present one of the main causes of reduced yields. Recent research into the science and practice of cultivation has shown that the disturbance of the soil and process of weeding can most definitely be over-done particularly in tropical soils whose structure is adversely affected thereby. Nevertheless native cultivators frequently fail to reach even the minimum requirements, and weed growth is commonly excessive in the early stages of the food crop, when it is most vulnerable to competition. Other aspects of crop production which have a pronounced influence on yields are spacing and interplanting, and much experimental work is needed upon them before definite advice can be given to cultivators. Inter-cropping has already been mentioned as a significant practice in the control of erosion and as a partial substitute for rotation; but the optimum spacing of the various crops inter-sown, the most productive mixtures and the relative times of planting of the constituents to give best results, all await examination in a great variety of soils and conditions. This wide subject, like the majority of the recommendations contained in this memorandum, depends upon the return of peace conditions and an increase in staff before it can be tackled.

B. IMPROVEMENT IN QUALITY OF FOOD.

As has been already mentioned the quantity of food is at present more commonly defective than the general quality of the native dietary. There are of course certain specific food factors which tend to be, or are suspected of being, deficient. Of these Vitamins B2 & C, Calcium and Sodium, are the more important but the list is increased and the deficiency greatly intensified in a cassava diet. This latter fact is one of considerable weight since, not only is the area under cassava already very big in certain districts, but there is an increasing tendency for maize and other cereals to be replaced by it in predominantly cereal-eating communities. It is the reason for this gradual process of change which is particularly noteworthy; it is the decline in soil fertility below the level at which a reasonable crop of maize may be expected with fair prospect. The soils in Chinteché and North Kota Kota are inherently infertile and almost universal cultivation of cassava as the principal staple is inevitable; but this is not so throughout the rest of the Protectorate. Not only does a poor soil inevitably produce crops of poorer dietetic value, but the range of foods which can be grown is automatically narrowed, and it is well-known that a wide variety of foods, particularly of staples, is the dietetic safeguard which is most particularly required in this country. It is abundantly clear, therefore, that the improvement of nutrition, so much discussed, is not merely a matter of introducing suitable varieties of crops and inducing the native cultivator to grow them: it is a function of soil fertility and is positively correlated with it. Once again therefore, the inevitable conclusion emerges that correct land usage and the maintenance of soil fertility offer the only hope for the continued and improved health of the native population, not to mention that of its greatly increased numbers in the future. If the land sinks to what may be termed 'cassava level' it is safe to say that good human nutrition from local resources will then be out of reach. There is a further current tendency inseparable from the encroachment of civilisation which mitigates against improvement in nutrition and that is the increased liking for the more refined imported foods and the wearing of clothes, which affects the supply of Vitamin D. These changes must be accepted, but they must at the same time be recognised as requiring improvements in the general diet to counteract them.

To refer again to the opening paragraph of this section, it can be seen that, whilst quality of food is at present of less immediate consequence to health than quantity, it is nevertheless susceptible of improvement and is threatened with deterioration in the future. Here again there is the obstacle to improvement that the African is not conscious of the deficiency of his diet, except in so far as it expresses itself in a craving for certain elements such as salt or calcium (in the case of lactating women). Moreover there is no ready incentive for the average native to strive for a better diet. In this connection, as in many others, it must be borne in mind that so many of the more progressive elements of the population have left the country and that those who remain are, for the most part, comparatively lacking in foresight and ambition. Negligible response has attended the efforts of those who have issued planting material of improved plants simply because they are better food. For the removal of the barriers of unconsciousness and lack of incentive regarding the quality of food, reliance must chiefly be placed in education and propaganda, but their effect is bound to be extremely slow when the unsatisfactory attitude and enlightenment of European peoples to improve diet, as such, is considered.

(1) Variety of Staple Foods.

To turn now to the more immediate practical aims from which a general improvement in diet may emerge. The first requisite is a greater variety of staple foods, particularly in the cassava-eating areas. It is by no means simple to intrude into the customs and prejudices with which staple foods are enveloped, but an increased consumption of rice and sweet potatoes is within the bounds of possibility if considered encouragement and guidance are given. They have the particular merits respectively of growing on wet land unsuited to other food staples and of being a satisfactory reserve crop, as mentioned in the section on Quantity of Food. Furthermore, neither of these exposes the land to erosion, an evil to which maize is particularly conducive. The particular aim in regard to maize should be the encouragement of varieties with a high carotene content (equally applicable to sweet potatoes) and the development of machine milling with the attendant benefits.

to the dietary of whole-meal flour. Although it may not properly be regarded as a staple food, groundnuts merit very particular encouragement all over the Protectorate. They are rich in protein and in Vitamin B components and are by custom nearly always eaten with green vegetables, whose consumption they therefore indirectly encourage, with a correspondingly increased intake of Vitamin C and carotene. Groundnuts have the added value, a considerable one, of not exhausting the soil, providing it with much needed cover and giving a reasonable yield at the same time when interplanted with maize. Moreover it is a crop that does not require careful weeding. (The need for experiment to determine optimum spacing when interplanted has been referred to earlier). Both culturally and dietetically it may therefore be regarded as complementary to maize. Similarly, though in a less degree, beans of various types would be of general benefit if more widely grown.

Both groundnuts and beans are already in common cultivation and susceptible of immediate extension were it not for the lack of any ambition or desire to do so, and consequent improvidence regarding seed stocks, etc. However, under the stimulus of higher war-time prices, the area under both these pulses has been increased very considerably and the amount of the resultant crop consumed has also increased. Here, then, is an incentive, admittedly limited in its power, which can affect the quantity of these valuable foods eaten. It is discussed at length in Part III of this memorandum under the heading of the increased production of cash crops.

(2) Dry Season Cultivation.

A further means by which the quality, as well as the quantity of foodstuffs may be improved is by dry season production on land moistened by a natural high water table or by artificial irrigation. The cultivation thereon of crops rich in Vitamin C and carotene, and the supplementary supplies of energy-giving foods which such sites can produce, offer infinite possibilities. In an earlier section of this memorandum the need for further experiment in the best use of wet land has been emphasized, and the dangers to soil erosion with which it is fraught were pointed out. The general subject of irrigation will probably require thorough examination within the next decade or so. There are very many and large stretches of irrigable, fertile country in the Protectorate (such as the Lake plain and the Shire Valley) whereon it will almost certainly be necessary in later years to augment the country's food supply to provide for its increased population, much of which may well be incapable of full self-sufficiency on its own land. The irrigation works envisaged would be on a large scale and would involve the damming of big rivers, projects which would necessitate the most expert planning not only by engineers but by soil experts versed in the reactions of soils under the influence of constant flooding and drying. Such investigations have been mooted elsewhere in connection with the stabilisation of the Lake level and a connected scheme for irrigating the Lower Shire plain.

(3) The increased Cultivation of Fruit.

The increased cultivation of fruits of proved value to the diet is another means by which the general level of nutrition may be raised, though it is not one from which rapid results may be expected. The majority of fruit trees take a few years to come into full bearing and it is as yet alien to the mentality of the majority of Africans to accord careful attention and protection from fire to possessions of no immediate value, particularly if their ultimate use is so dull as a seasonal food of unappreciated importance. The banana is perhaps in a slightly different category, and might almost have been included in the discussion on alternative staples, since it occupies such a position in certain other territories. It is, moreover, a food already popular in a minor degree and takes less time to come into bearing than do many other types. Banana plants have the added value of strengthening stream banks, acting as checks to erosion and can therefore serve a small though useful, part in conservation agriculture. Their cultivation should receive encouragement, but once again progress will be slow unless it be made compulsory to plant them along stream banks, as was done in the Misuku Land Usage Scheme, to demarcate the protected strip.

In view of the attitude of the average native to other fruits, hardy types only must be selected which will thrive in spite of him rather than because of him. Mangoes and pawpaws are notable examples in this category, and peaches and guavas, which are more suited to higher altitudes, may also be included. Good trees of these types are being tested and multiplied on certain stations of the Department of Agriculture, and this work should be increased, but the system of distribution to the African public should not be haphazard if waste of effort and material is to be avoided. Issue should be largely confined to the environs of towns and major settlements, where the trade incentive is more strongly developed and where the consuming population has the necessary purchasing-power to encourage continued production and marketing. It is reasonable to suppose that the influence of a higher standard of living and the consumption of fruit, etc., in towns will gradually evoke imitation within an ever-increasing radius from these centres. It is suggested therefore that the multiplication of fruit trees be particularly included among the crops grown on the Native Administration Seed Farms established nearer towns. To a less extent should young trees be made available, in what might be contrasted as the rural areas, but their distribution should be more carefully restricted to natives known to be likely to care for them properly.

It is unnecessary to emphasize that the experimental work on the evolution and selection of heavy-yielding food crops, discussed in an earlier section, should also take full cognizance of nutritive value.

(4) Animal Products.

The dietetic aspect of edible animal products is well known, and a vast potential supply of them exists in certain districts in the Protectorate. The immediate problem is not so much to increase or improve this source of food, but to modify the native attitude towards it so that it may become a common article of diet, and at the same time contribute its essential quota to the

maintenance of soil fertility. It is safe to say that at present livestock do far more harm than good and that tsetse fly may even be regarded as a blessing in disguise in that it has prevented the damaging effects of cattle from spreading unchecked throughout all the Protectorate's lands during the period of its population's ignorance. This attitude is obviously untenable in future policy, and tsetse fly must ultimately be controlled and evicted with increasing urgency as the proper use and management of livestock becomes part of native economy. It is not proposed, however, to discuss here methods by which the highly technical process of tsetse control should be implemented.

The immediate problem affecting human nutrition is to formulate schemes which will give impetus to the consumption of animal products, and subsequently to improve the supply and quality of those products. From present evidence the employment of a monetary incentive for "by-products" seems to offer the best hope of success. The ghee industry has already shown an indirect usefulness in inducing the consumption of skim milk after the sale of cream, and it is reasonable to suppose that the prevalent disinterest in milk, and even milking, could gradually be overcome if the ghee industry were encouraged by the payment of more remunerative prices for cream. Further reference will be made to the economic aspect of this and allied matters in Part III.

Of still greater value for the common good would be a flourishing trade in hides since, not only would the consumption of fresh meat increase, but the damaging action of cattle could be reduced to some extent by keeping the stock population in check. Moreover, if the hides were converted locally into rough foot-ware and other leather goods, a flourishing minor industry might emerge with attendant benefits to the native population by the reduction of bilharzia and hookworm. The Polytechnic could undertake the training of operatives for a small leather industry. The economic possibilities are here again mentioned in Part III.

As a parallel to the above attempts to encourage the consumption of animal products, a plan has already been evolved for the improvement of native cattle by selection on the basis of milk-production, and the breeding and issue of bulls prepotent for the character of milk.

PART III.

The Increased and more Economical Production of Cash Crops.

At the risk of excessive repetition it should again be emphasized that any scheme to increase production from the land, particularly for export, should be preceded and accompanied by adequate measures to restore and maintain its fertility. It was for this reason that the discussion of Land Usage occupied the first part of this memorandum.

A. THE CASH INCENTIVE IN NATIVE AGRICULTURE.

The objective for native agriculture which is most frequently quoted is a reasonable cash return from the land, which will enable a standard of living not too dissimilar from that derived from urban employment. For this objective to be attainable at all under local conditions it is essential that the efficiency of production and marketing in all their phases should be of the highest order, a level very far distant at present, particularly as regards cultural methods. Normally where a high degree of efficiency is lacking the principal effects are hindered progress and a low standard of living. In Nyasaland, however, there is a third factor which is brought into play—namely emigration. Sympathetic though the general feeling may be towards emigration it is commonly regarded, in its present excess, as harmful to native social structure, and the country looks to the development of agriculture to provide a successful counter-attraction and at the same time to raise the general standard of living. Crop production under pre-war conditions fell far short of this assignment and it is to be expected that the tendency to emigrate will increase with the cessation of hostilities unless there is a much stronger incentive to remain at home and put that extra effort and efficiency into agricultural production that brings its own financial reward. Reasonable immediate returns are the only attractive incentive. At normal pre-war prices the ordinary progressive and ambitious native of Nyasaland cannot be expected to intensify his efforts in the land to the pitch at which he would reap reasonable profit: he takes the easier and more lucrative path to South Africa instead. There is thus a vicious circle which, it is contended, can only be broken by the guarantee of minimum prices at a level which will give a reasonable return to the average cultivator with his present standards and encourage him to make efforts to increase his efficiency. Such financial security and assistance is widely recognised as an essential basis for rural development in Britain and elsewhere. How much more so in Nyasaland, where the future economic and social prosperity of the country depends so very much upon the livelihood to be derived from its soil?

It would appear, therefore, that in considering the future development of native agriculture an early decision must be taken as to whether the exceptional circumstances imposed by the facility of emigration justify financial assistance to agriculture, which might provide the impetus to more efficient production at present lacking. There are admittedly many natives whose response would be negligible and whose efforts would not justify added reward but it is suggested that the above measures would give some hope and encouragement of rural development to many of the better type of African who now remains discontented or satisfies his ambitions abroad.

In more advanced communities of larger farmers financial encouragement is frequently given in the form of a bonus to those who adopt certain practices of lasting benefit to the land itself. Clearly such a system, admirable as it is in theory, could not be applied in practice to an African peasant community. The nearest approach to it might be to guarantee prices, particularly for crops like groundnuts, beans, rice and wheat, whose extended cultivation would be beneficial to local human nutrition, and which have the added merit of assisting the maintenance of fertility or encouraging the use of land not yet fully developed. In the same category might be included ghee and hides for reasons discussed in the preceding part under Animal Products in relation to

Quality of Food. The principal export crops of the Protectorate are not food crops and it is the latter which justify particular encouragement for the common good. There being no ready or extensive external market for this class of commodity at prices remunerative to the African grower, it is necessary to look to increased internal consumption to absorb increased production. With an efficient marketing system and cheap internal transport the local absorption of food crops should increase considerably, but it would be decidedly advantageous if an agreement could be concluded with South Africa whereby the Union undertook to absorb all Nyasaland's surplus foodstuffs in return for a market offered for the products of her secondary industries, which she is particularly anxious to maintain. This suggestion is included in view of the stated intention of the Joint Development Adviser to Northern Rhodesia and Nyasaland to discuss this possibility during a future visit to that country. It would not be in the general interest however, that the cost of food crops to the consumer should increase unreasonably or that the guaranteed price paid to the grower should prejudice the opportunities of export. It is not presumed here to discuss financial measures by which guaranteed prices might be supported but unless an entirely artificial situation is to be created it would be necessary for the price guaranteed to be related to the value of the products concerned in the centres of consumption. In the event it might prove that the necessary stimulant to production would still be lacking but there is no evidence that this would necessarily be the case. However, should the guaranteed price be found to be too low to provide the required encouragement there are possible sources from which the extra finance could reasonably be obtained. For instance, if emigrant labour were organised, it might be feasible and reasonable to impose a capitation tax, payable by the employers of emigrant labour, which should contribute towards the prosperity and encouragement of those remaining at home to develop their heritage. Alternatively more financial aid might be derived from the tobacco industry by agreement with the United Kingdom. Before the war the native tobacco grower received but 1.56 per cent of the value of the manufactured product sold to the consumers in the U.K. The latter country also absorbed 25 per cent. of that value as import duty, a sum amounting to about £8½ million per annum, which had risen in 1942 to over £40 million. Indirect financial incentive might be given with good results by reducing the import duty on certain classes of trade goods, particularly those calculated to appeal to African women and spur them and their male relatives to greater money-making efforts to buy them.

B. OTHER FACTORS INFLUENCING THE EFFICIENCY OF NATIVE PRODUCTION OF CASH CROPS.

Of the very many means by which the efficiency of production of economic crops may be stepped up, some have already been discussed in detail in Parts I and II since they are either connected with the conservative use of the land or concerned with cash crops of particular value as human food. To emphasize the essential part they would be required to play in increasing production they may conveniently be mentioned again as headings.

- (1) Instruction, demonstration and propaganda regarding improved methods.
- (2) Increased European staff, both Departmental and Administrative, to carry out (a) above and to organise marketing and development generally.
- (3) Testing, bulking and distributing of improved seed stocks and planting material.
- (4) The gradual introduction of mechanical implements to save the cultivator's time and to reduce the congestion of work at the peak period.
- (5) The erection of Native Authority maize mills to save time now necessarily devoted by women to pounding grain, and to enable them to spend more time in profitable occupations.
- (6) The development of the use of 'wet' land in the dry weather for the increased production of crops, and the gradual extension of irrigation—possibly on a large scale in certain suitable areas.
- (7) The elimination or reduction of pests and diseases.
- (8) The introduction of improved methods of crop storage.

Two other subjects may be mentioned specifically as having considerable influence on the production potential in certain areas.

(9) *The development and improvement of village water supplies* to facilitate wider settlement and the fuller use of the land. Details of the areas in which new or more intensive settlement may be induced by these means have already been submitted to the Geologist, who has prepared a comprehensive scheme but it is considered advisable to utter a warning that no very spectacular increase in the total crop production of the Protectorate can be expected therefrom. There are no large tracts of fertile land which remain unsettled on account of lack of domestic water, and it will be necessary to exercise considerable care in the selection of land on which settlement is to be promoted so that the clearing of unsuitable 'short-term' soils may be avoided. This matter will doubtless receive close attention in the district land planning envisaged in Part I. Nevertheless general increase in the efficiency of production may be expected from the provision of better and more accessible water.

(10) *The control of destructive game.* There is no doubt that the damage inflicted on the native cultivator's garden by marauding game is a very potent factor in his economy. The trouble has been greatly accentuated during the war owing to the shortage of ammunition, but even in pre-war times the loss and discouragement suffered throughout many districts constituted a real menace to production and food supply. In tracts of country such as the Kota Kota Lake plain, sandwiched between the lake and the game reserve, it is common to find rice cultivators whose entire crop has been utterly destroyed in one night by buffalo and hippopotamus. Elsewhere

baboons do very extensive damage every year. Doubtless the recently appointed Commission charged with the duty of examining, *inter alia*, Game Reserves, will make a full study of this important matter. It is urged, however, that marauding game of all kinds should not be permitted to affect crop production and the cultivator's livelihood. Organised control by carefully selected and supervised hunters is recommended, and would provide most useful employment for a reliable type of "ex-askari".

(11) In the urban areas the scope of native crop production is adversely affected by the prevalence of a system in which urban wage-earners retain a foothold in the land, and persist in casual cultivation to supplement their purchased food supply. In consequence valuable land in the neighbourhood of towns is not put to its fullest use and at the same time the livelihood and profit to be derived from specialised food production for cash is denied to others who might more efficiently undertake it. In more advanced communities the balance between producer and consumer would be seriously dislocated were either to attempt professional inroads into the other's sphere. There is no practical means by which this state of affairs may be rectified within a short space of time, but it is probable that urban workers will gradually cease to cultivate land as land itself becomes more scarce and urban wages rise. However, any consideration given to the regulation or guidance of native land tenure should aim at the strong discouragement of the land owning urban employee.

C. NOTES ON INDIVIDUAL CROPS OF PRESENT OR POTENTIAL ECONOMIC IMPORTANCE.

(1) **TOBACCO.** On account of its direct monetary value and the indirect benefits of employment, trade and transport, which the tobacco industry brings to Nyasaland it is a crop of paramount importance. (a) *Experimental Work.* Before commenting on various matters peculiar to the different types of tobacco grown in the Protectorate, it is proposed to draw attention to the present absence of any local facilities for planned experimental work to ensure the efficient development and maintenance of this crop in the critical post-war period. It is considered that a definite and urgent need exists for the establishment of a Tobacco Experimental Station within the Protectorate. If the importance and value to the country of the tobacco industry is borne in mind it will be readily appreciated that the absence of such a station and, indeed, of any organised and centralized tobacco research and development work, is an unreasonable and unjustifiable risk and one which should be removed without delay.

The fact that there has not previously been any demand for such a station is attributable very largely to the work which was undertaken by Captain A. J. W. Hornby during the twenty years in which he served as a member of the Department of Agriculture. That officer personally conducted all experimental work in connection with tobacco, operating both on Government Experimental Stations and on Private Estates, and the greater part of his time was occupied with such duties. Thus, whilst he remained on service in the Protectorate, there was no particular need for a Tobacco Research Officer and a Tobacco Station, but that situation no longer prevails.

It should be remembered that the function of research is not only to keep abreast of current practice but, more important, to pioneer the way of future development and it is in this connection in particular that the absence of a Tobacco Station is being felt. The industry is at present in a comparatively healthy condition, though doubtless many improvements therein would be introduced as a result of experimental evidence, but there is a marked absence of any investigations designed to secure larger and better crops by the processes of plant breeding, field and cultural technique, fertilizer application and allied matters. Moreover, the taste of the smoking public is subject to change and it is considered important that different and new varieties of tobacco, possessing varying flavours and qualities, should be constantly under observation.

Consideration has been given as to whether Nyasaland's requirements in this matter could not be entrusted to the Trelawney Tobacco Station in Southern Rhodesia, in return for an annual financial grant, but expert opinion is unanimous that such a course would not achieve the desired result. It is pointed out that the tobacco plant is particularly influenced by environmental conditions and that results obtained elsewhere would not necessarily be applicable to this country. Moreover, none of the existing experimental stations are considered to be suitable for the purpose.

It is recommended, therefore, that approximately 500 acres of land should be acquired in the Lilongwe District. This would serve as the headquarters station, but the station officers would also conduct subsidiary trials in the various tobacco zones of the Protectorate. An estimate of the cost of establishment and future maintenance of such a station has been prepared and the capital cost amounts to £13,140 whilst the annual recurrent expenditure in the early stages is estimated at £3,342. ~~(Details are given in Appendix B).~~ It is not suggested that the funds required need necessarily be obtained by application for a grant from the Colonial Development and Welfare Fund and it is submitted that these might reasonably be obtained from the recently established local Native Development and Welfare Fund. Alternatively, as the Station is designed to be of service to all growers of tobacco irrespective of race it might be held that it should be financed wholly or in part by a tax or cess on tobacco exports from the Protectorate.

(b) *Flue-Cured.* The production of flue-cured tobacco, which is entirely a European enterprise, is diminishing annually and is the cause of much concern. The quality and flavour of the locally grown product is stated by manufacturers to be inferior to that produced in the Rhodesias and as those countries also enjoy the benefit of a duty-free quota of tobacco into South Africa, which is denied to Nyasaland, the local product realizes considerably lower prices than elsewhere. There is a marked tendency therefore, for growers either to transfer themselves to Rhodesia or to cease production. It is hoped that investigations carried out at the new Tobacco Experimental Station might lead to the evolution of types possessing superior quality and flavour. As an interim measure an experiment is planned for commencement in 1945 to ascertain whether the Kasungu District, wherein a considerable area of suitable 'flue-cured' land exists, may not be

capable of producing a leaf more approximating to the Rhodesian product and one, therefore, calculated to secure an enhanced price to the grower. It has been emphasized by various tobacco interests that it would be essential to pursue only those methods of production calculated to give the highest quality of leaf, and it is therefore necessary that the experimental work be conducted on appropriate lines and having every reasonable facility at its disposal.

(c) *Dark-fired and sun-cured.* These two types are produced by both Europeans and Africans and at the present time the industry enjoys no little prosperity. There is, however, no assured stability. The future of Imperial Preference remains undecided, whilst the taste of the smoking public is changeable, and considerable anxiety is therefore felt regarding the future. As a measure of insurance, if nothing else, it is imperative that the country should be prepared to supply without delay whatever types of leaf are in current demand and it is intended that the Tobacco Experimental Station would keep continuously abreast of opinion and in a state of constant readiness to supplant any one quality or type with another. Again, under the stress of post-war competition a high level of efficiency in the field will be necessary if quality is to be assured, and for this purpose an adequate supervisory staff (as recommended in Appendix A) is essential.

(d) *Turkish.* Turkish tobacco is at present in the experimental stage. The work is being conducted on Government Experimental Stations but would be transferred to the Tobacco Station if the latter institution were to be established. It will have been noted that Southern Rhodesia is in process of developing a prosperous Turkish tobacco industry and it is considered that exploratory work on similar lines in this country should be stimulated.

(2) **TEA.** The development of this crop is controlled by the International Tea Committee and it is not therefore possible to formulate plans locally. Actual production is likely to show a substantial increase during the course of the next few years as new acreages come into bearing. A full programme of experimental work is being undertaken at the Mlanje Experimental Station and it has been proposed by the East African Agricultural Research Committee that tea research for the whole of East Africa might more conveniently be concentrated with headquarters in Nyasaland. This would doubtless be a great asset to the tea industry of the Protectorate.

Plans are being made for the training of selected ex 'askari' after the war for professional employment on tea estates.

(3) **TUNG.** At the present time this crop is almost entirely in the hands of European estates but it is the intention to extend cultivation to Africans in such areas as may be shown by experiments now in progress to be suitable. The rapid development of tung throughout the Protectorate is held to be an objective of the greatest importance and separate proposals for its achievement are at present under consideration by Government. As in the case of tea the Tung Station may receive the added importance of serving as the main Station for the whole of East Africa. Again, as for tea estates, plans have been made for a thorough training in tung estate work of selected ex 'askari' after the war.

(4) **PYRETHRUM.** In the Nyika Plateau area pyrethrum growing has now passed from the experimental into the commercial stage but it seems unlikely, in view of the conditions prevailing in the area of production, that development will be rapid. A particular need for the profitable furtherance of this project, and indeed for all production in that area, is better and more direct communications with the Lake for the cheap evacuation of produce. Further trials are at present being conducted in other potentially suitable areas (e.g. Misuku Hills, the Kirk Range, Kota-Kota Hills, Zomba Plateau and Mlanje Mountain). If these prove to be successful, and provided that the world demand for pyrethrum continues, no particular difficulty is apprehended in securing further commercial development on a limited scale.

(5) **CINCHONA.** It is commonly understood that there is likely to be a world shortage of quinine for some years to come as a result of the Japanese occupation of the main producing countries in the East and for this reason investigations into the possibility of growing cinchona in various parts of the Empire are proceeding. The matter is considered to be of such importance that an Empire Cinchona Research Scheme has been introduced, one station of which will be situated in East Africa. The suitability of the crop for adoption in Nyasaland is at present unknown and trials are accordingly being undertaken in potentially suitable areas.

Blocks of trees have been established at selected centres and the resultant material will in due course be available for examination at the Research Station mentioned above.

(6) **DERMIS.** Experiments with this crop over a number of years and in widely separate areas have shown that the rotenone content of roots produced in Nyasaland from selected Amara material is generally so low as to render its production an unprofitable undertaking.

(7) **COTTON.** Cotton production is mainly the occupation of Africans though a small number of Europeans produce limited acreages on the tenant system. Informed consideration of future development or the status of the crop in the country's economy is a matter of some difficulty in view of the presence of a number of unknown factors which are outside the control of any local authority or interest. During the period of the war years cotton from Nyasaland has not been a commodity in demand from any quarter and the policy has therefore been to maintain production at a reasonable level so that the industry may be capable of expansion as circumstances permit require. Given the demand, with prices at a remunerative level, it is considered that a very substantial increase could be attained, particularly so in the Lower River districts when the Bollworm has been brought under control. (The officers of the Empire Cotton Growing Corporation who have been conducting research into all aspects of this pest have virtual

concluded their investigations and their recommendations are expected to be presented to Government early in 1945). In the meantime the Empire Cotton Growing Corporation station at Domira Bay continues its valuable work in evolving high-yielding and pest-resistant strains of high-quality lint. Some promising new cottons are at present undergoing large-scale trials and bulking.

(8) RICE. A very substantial increase in rice production has been achieved in the past few years and from natural causes alone, particularly from improved planting technique, further expansion may confidently be anticipated. However, in the main producing areas on the shores of Lake Nyasa there is a limit to the extent of the land suitable for production unless a system of mechanical irrigation is introduced and it must be emphasized that this would not be a simple matter of constructing water furrows or impounding water. In the Kota Kota area particularly the slope of the land down to the Lake is often too gradual to permit of individual cultivators taking any advantage of the water contained in neighbouring water courses and it would be necessary for an elaborate and controlled irrigation scheme to be introduced. It is recommended that the services of the Water Engineer mentioned in Part II B (2) of this Memorandum should be directed into the matter, but it should be borne in mind that the expense might be found to outweigh the value of such increased production as might be made possible.

The Limpasa Valley in West Nyasa District presents a special problem. This large area is eminently suited to the production of rice but it seems unlikely that it will ever be developed by individual African growers. The local native is a poor and disinterested agriculturalist and in any case is insufficiently numerous for the full development of the valley. It is postulated therefore that some commercial concern should be invited to become interested. The area merits detailed examination with a view to mechanical exploitation such as Africans are at present unable to contemplate. The project might profitably be worked in conjunction with development on the neighbouring Vipya Plateau, to provide food for the latter.

The methods by which rice is at present produced make it particularly susceptible to variation in rainfall and to a less extent, Lake level. Of recent years shortage of rain has had a serious effect on the present long-term variety (Faya) in common cultivation throughout the lake plain. The control of the Lake level and the introduction of irrigation would, of course, remove much of the doubt which now accompanies rice growing; but for the time being it is highly desirable to introduce varieties which mature in a much shorter period whilst including at the same time the other good characters of Faya. Trials of introduced and local selections have therefore been in progress for some years and some promising varieties are emerging.

The depredations by game are a very serious discouragement to rice growers in some parts of the Protectorate, and the subject of protection from this form of damage, being important, has thus been considered separately in this Memorandum.

It should be noted in connection with rice generally that the saturation point for internal consumption has already been reached. The measures to be taken to improve the dietary standards of the local inhabitants will doubtless be reflected in an increased demand for rice from within the country but it should be realized that any large scale expansion of rice production will depend to a great extent upon the securing of export markets. This constitutes a matter of very considerable uncertainty and one which cannot be properly investigated until normal trading conditions return.

(9) GROUNDNUTS. The first requirement with this crop is to increase production to meet the internal needs both present and future, of the Protectorate. Under the stimulus of high prices some progress is being made and growers are paying increased attention to the potentialities of the crop. An urgent necessity is to improve the methods of cultivation in the field so that returns more commensurate with the labour expended may be attained and this aspect of the matter receives constant attention and has been discussed earlier in this Memorandum with particular reference to inter-cropping. A return to the prices prevailing before the war would, it is feared, spell stagnation for the potential industry until substantial improvement in the methods of cultivation has been widely secured. It must be remembered, however, that the monetary value placed by natives on their groundnuts is far higher than that which can be paid for export, and if it is intended materially to expand production of this valuable commodity the price paid therefor must be such as to constitute a definite incentive to production, at least until cultural methods increase yields appreciably.

(10) PULSES. Beans and peas call for no comment. Many varieties are widely grown throughout the Protectorate and they are an important item in the dietary. In most years there is a surplus for disposal but there is no indication that under normal conditions it would be wise to stimulate production for the purpose of external sale or even that a ready market could be found outside the Protectorate. The position will require further examination under peace-time conditions.

(11) MAIZE. This is the staple food crop of the majority of the inhabitants of the Protectorate though in certain areas it is regarded as no less important as a cash crop. Prevailing prices are still deplorably low and provide no incentive to surplus production in localities where alternative crops can be grown. This should not, however, be regarded wholly as a disadvantage, since it provides an impetus to the cultivation and consumption of alternative staples, to the benefit of diet and to the economic advantage of the producer and the better use of his land. It is contended that no more maize is required than that which is needed to sustain the producing population plus a small reserve, and to meet the reasonable demands of local estates and other non-producers. It would not be advantageous in any way for Nyasaland to attempt to build up an export trade in maize even were it economically possible. Not only does the proportionate area under maize already exclude the possibility of balanced rotations but as already mentioned, it predisposes the soil to erosion on account of its habit and spacing. Moreover, the type of maize most commonly required for export is white in colour and soft in texture, being thus inferior dietetically and in

keeping quality to that at present grown. The free-crossing habit of maize would make it virtually impossible to separate export from local varieties, to the mutual detriment of both.

(12) EUROPEAN POTATOES. During the past three years there has been a rapid expansion in the production of European Potatoes. During 1944 some 650 tons were harvested surplus to the normal requirements of the Protectorate and there is little doubt that this figure could be increased to 2,000 tons if a permanent and secure market could be obtained. In an attempt to secure a market in Portuguese East Africa grading rules have recently been introduced at markets in the main producing areas but it is as yet too early to judge to what extent this measure will attain the desired objective. By comparison with Southern Rhodesia, Nyasaland is at a disadvantage as regards the landed cost in Beira, for the reason that whereas produce from this country is subjected to a Customs tariff that from Rhodesia is admitted duty free. It is understood, however, that in order partially to offset this handicap the Nyasaland Railway Authorities are considering a reduction in the freight rate. An attempt should be made when normal conditions return to obtain regular contracts for the supply of potatoes to ships calling at Beira. In the meantime efforts are being made to improve the keeping qualities of the potatoes so that they may better withstand prolonged transport and storage under tropical conditions, circumstances which have proved to be particularly severe upon the crop and capable of extensive damage to the tubers. Experiments to compare imported and locally selected seed are also in progress.

(13) EUROPEAN VEGETABLES. Good quality vegetables are produced in many parts of Nyasaland but increased production for sale cannot be contemplated in the absence of adequate markets. As in the case of potatoes an effort should be made whenever circumstances permit to secure contracts for supplying vegetables and fruits to ships using the port of Beira. An investigation is to be undertaken to ascertain the extent to which dehydrated vegetables would be marketable in the Protectorate.

(14) WHEAT. In view of the difficulty of obtaining supplies of imported flour after the outbreak of war, strenuous efforts were made to increase the local production of wheat. That these were not unsuccessful is shown by the fact that as against a negligible quantity produced in 1939, over 370 tons were harvested in 1944. This figure represents a large proportion of the total annual requirements of the country. There would not appear to be any prospect of gaining any export connection for this commodity but it is known that growing numbers of Africans are acquiring the taste for wheaten products and the increasing demand from this source should assure growers of a reasonably stable market for their produce.

It has been mentioned earlier that the incentive of a reasonable price is essential for the continued success of this useful minor crop. At the present price to the grower of 14d. per lb. flour is produced at the mill at approximately 3d. per lb. more than the pre-war price of imported flour landed at the same place. Clearly therefore, if an attractive price to the grower is to be maintained, and at the same time a reasonable and competitive price for flour allowed to the consumer, the cost of transport of wheat to the mill must be reduced to a minimum. It is also most desirable that the baking quality of the flour should be improved, and to this end trials are made annually of improved imported wheats with the object of obtaining one which under local conditions, combines this feature with rust-resistance, resistance to bird damage, good yield and early maturity; these being the particular "desiderata". If these and the economic requisites already mentioned can be fulfilled there is no reason why wheat production should not be doubled and the steadily-increasing local consumption satisfied from within the Protectorate.

D. MARKETING OF ECONOMIC CROPS.

Efficient, expeditious and economical marketing of produce is a vital factor in the development of a prosperous agricultural industry and one to which increasing attention has everywhere been paid during the past decade. An adequate communication system and an equitable transport-rating tariff are priority requisites. With regard to the former, Nyasaland is comparatively well served with roads and rail though transport on Lake Nyasa leaves much to be desired. Further roads are either in course of construction or are projected and it is safe to assume that others would be constructed whenever the need arises. The commissioning of the new steamer during 1945 should do much to relieve the congestion of traffic on the Lake and it is understood that the fleet of tugs and lighters is to be augmented whenever circumstances permit. Early improvement in wharf and loading facilities is an urgent requirement but the provision of permanent facilities must await decision regarding the stabilization of the Lake level.

The rating system both on rail and road has recently been investigated by an expert and it is to be hoped that a more balanced tariff may be introduced as a result of his recommendations. Road haulage rates are particularly severe on low-value bulk produce and the Motor Traffic Licensing Board is taking the necessary steps to ensure that charges in the future will be more allied to actual costs.

In connection with communications generally it might be remarked that singularly little use is made in Nyasaland of inland waterways. In adjoining territories considerable canoe traffic does much to relieve pressure on other forms of transport and it would seem desirable to ascertain whether there is any impediment to similar activity in Nyasaland which could be removed.

Another agency by which the local movement and marketing of produce should be facilitated is the farm cart. There is evidence that the more progressive native is anxious to exploit this form of transport if the primary difficulty of the supply of wheels and axles can be overcome. In this connection it would be wise from the start to encourage the use of pneumatic-tired cart only in view of the damage and erosion caused by solid tyres and sledges, and it is believed that the Government is prepared to consider the acquisition of axles and wheels complete from the light tyres of War Department vehicles after the war. The construction of farm cart bodies might with advantage be taught at the Polytechnic.

In this Protectorate the collection and handling of crops in the areas of production presents no special difficulty. Notes on the main crops are appended. As regards the internal marketing of subsidiary produce (e.g. maize, pulses, rice, potatoes, groundnuts and wheat etc.) the Marketing of Native Produce Ordinance was introduced in 1939 and has been progressively applied to districts and areas where the volume of production has so justified. The organisation operates smoothly and efficiently and has been of considerable benefit and assistance to buyers and sellers alike.

TEA. As a war-time measure a form of collective marketing has been introduced, inasmuch as the whole crop (excluding small quantities for the "domestic" markets) is delivered to the Tea Controller on behalf of the Ministry of Food. It is suggested that the Nyasaland Tea Association would be well advised to consider the perpetuation of a collective marketing system, on the lines perhaps of the Kenya Pyrethrum Growers Association, when the present control is removed. Nyasaland teas are only of medium quality, though yields and costs of production compare favourably with elsewhere, and it would seem, therefore, that producers would be better able to compete in the world's markets by pooling their produce and marketing it collectively. This would be particularly so in the event of a repetition of the slump experienced in pre-war years but it is appreciated that a number of estates have established valuable private connections which they would not readily wish to sever.

TUNG. It seems probable that circumstances will necessitate the collective marketing of this product in the majority of cases. At the present time it is so handled, there being only one factory in the country for expressing the oil. Whilst producers have the option of having their nuts processed on commission (the resultant oil being returned to them for disposal) almost every grower prefers to deliver his nuts to the Pool and to receive a proportionate share of the profits. As this industry develops more factories will have to be erected but many growers will not be operating on a scale sufficiently large to maintain their own expressing plants and it seems probable, therefore, that they will continue to support, and to be dependent upon, communal or collective factories.

TOBACCO. This is a much more complex problem. Tobacco is produced both by Europeans and by Africans and in the latter case it is already marketed collectively by the Native Tobacco Board, that is, up to the stage at which it is ready for processing to meet individual manufacturer's requirements. It would be possible for the Board to undertake the final marketing of the crop in overseas consuming markets but there are many pertinent objections to such a course. Both as regards European and native production it is doubtful whether any controlled system of marketing is possible, or even desirable, though there is a large body of opinion which considers that all tobacco should be sold through the agency of the local Auction Floor. Manufacturer's requirements are extremely individualistic and personal trade connections, as practised at present, would seem to be the only practicable method of ensuring that the consumer receives the article which he desires.

COTTON. Various marketing systems are in operation in British cotton-producing countries, each suited to its own particular conditions. In Nyasaland a series of systems have been tried, each possessing merit and each with its limitations. It must be remembered that even under normal conditions the crop is highly speculative and price fluctuations are bewildering and that the world markets are almost wholly controlled by American production. In any event, in view of the comparative smallness of local production, it is certain that Nyasaland could not operate a marketing scheme independently of others and it would be necessary to pool the crop with East Africa or some other large producing group. It is considered, therefore, that there is no option other than to await developments elsewhere.

E. LABOUR.

It is a matter of common difficulty on the majority of European estates that labour supply is irregular and of indifferent efficiency. The reasons for this are many and varied, but if the settlement in Nyasaland of immigrant labour is rigidly prevented, as it undoubtedly should be for reasons already discussed in Part I, the difficulties of the employer are likely to increase.

The problem is a complex one involving many factors beyond the scope of this memorandum, but it is suggested that beneficial results might be achieved with certain crops from a system in which the employee is given the incentive of a stake in the land and crop on which he works and the prospects of added financial return from its management. Thus the more reliable and energetic type of labourer might be allocated the responsibility of cultivating and tending a small block of established crop by his own efforts and those of his family, in return for which he would receive a definite proportion of the value of the produce harvested from it. In this manner the output of work from these individual families, selected gradually from amongst the labour force, might well exceed in amount and quality that of the normal labourer, and fully justify the higher return paid to them. To avoid the conflict of interests which inevitably results when the "tenant" possesses a large food garden of his own it might well be necessary to feed him and his family and leave them with the cost of the rations. Similarly if the work of the tenant was retarded as a result of idleness, illness or other causes, the employee would need to supplement his efforts with paid labour, again debiting the "tenant" with the cost thereof.

It is not suggested that such a system would function successfully on a fine-cured tobacco estate on which the closest expert supervision is at all times essential. Furthermore, with annual crops particularly, there is the ever-present danger that soil conservation will be neglected in the anxiety to extract the maximum crop from the land each season, the results of which are in evidence on certain tenant tobacco estates. As already mentioned, however, there is reason to believe that the adoption of such a system might greatly ease the labour problem on tea and tung estates if arranged on the basis of proper contracts and, if in addition, the danger of theft, in the case of tung particularly, can be guarded against adequately.

Though wages are doubtless the most important influence in the labour problem there are other aspects of the matter which deserve and require greater attention and whilst it is appreciated that some progress has been made in the social and welfare environment of labourers there is much ground still to be covered. Mention is made here of the following:—

(a) *Housing.* Notable improvement has been made in the matter of providing decent weather-proof houses for African labour but though the dwellings provided may be superior to those commonly found in the villages, they mainly suffer from such defects as deficiency of space, inadequate roofing and lack of floor or paving. Moreover, the general appearance of labour lines is important if barrack-like formations are to be avoided and they should be competently planned, due provision being made for schools, churches, shops and community halls.

(b) *Nutrition.* The connection between low wages and malnutrition is obvious but a rise in the wage level is not the complete solution. There is a growing demand by labourers for such commodities as fish and meat and it is not unusual to find workers spending an appreciable part of their wages on these additions to their diet. Prices are often exorbitant and supplies inadequate and it is felt that employers would find it to be equally in their own interests to facilitate the availability of such products at reasonable prices. Additionally also, the food issues made to labourers are frequently inadequate for a family man. A labourer who has his wife and family living with him is more likely to be stable and contented than the "grass widower" and it is considered the reason why so many Africans elect to engage in paid employment for short periods only is that they have found it necessary to leave wives and children in the villages where food is more plentiful and where they can maintain gardens.

(c) *Health.* No emphasis on the benefit to all concerned of a healthy labour force would appear to be necessary since, in theory, the position is fully appreciated. In practice, however, singularly little effective action is taken to improve the health of labourers generally. Water supplies leave much to be desired and dispensaries, when provided, are often ill-equipped and staffed. If it is conceded that the efficiency and capacity for work of the labour force is a most important asset in any undertaking, the necessity for achieving and maintaining a high standard of health is clearly of paramount importance.

(d) *Social.* A deciding factor in the desire of so many local Africans to migrate to Southern Africa is the comparative dullness of life at home as compared to the excitements of more urbanised countries and it is suggested that if this state of affairs is to be combated, counter attractions must be provided. In so far as this problem affects the supply and efficiency of labour, estates might beneficially consider the employment of welfare workers who, amongst other pursuits, would organise social clubs and functions, libraries, sports and cinematograph shows. The development of the qualities of self-help and self-reliance amongst Africans has great potentialities in preventing the spread of disease, removing illiteracy and generating a pride in work and environment and employers of labour would be amongst the first to benefit from any rapid advancement in these directions.

PART I.

Conservation of Soil, Soil Fertility and Natural Resources.

An urgent problem of paramount importance with considerable Administrative, Political and Technical implications and requiring the formulation of a definite Land Usage Policy.

A. LAND USAGE POLICY.

For the formulation of which much fundamental data are required. A Land Survey is urged for the collection of this data. Other subsequent requisites are:

B.

MACHINERY FOR IMPLEMENTING LAND POLICY.

Essential parts of the machinery are:—

(1) District Land Usage Plans to give effect to the Policy in each Administrative Unit according to its particular needs. (Soil Conservation Scheme has been submitted as immediate project).

(2) Comprehensive Legislation to facilitate and expedite the execution and maintenance of plans which cannot be put into effect in time by any other means.

(3) Increased European staff to supervise the timely execution of land plans and to provide adequate instruction regarding measures to be adopted.

(4) General Education of African population to teach it to appreciate and control its environment and natural resources. This is the long-range solution of the urgent problem for which more drastic interim measures are advocated above.

(5) Propaganda. Essential as a specialised short-range weapon to support and explain legislation and conservation measures and to counter any political repercussions.

(6) Control of immigration and indiscriminate local movement of population to avoid land wastage and the imposition of an excessive strain on certain areas.

(7) Experimental work on the maintenance of soil fertility to determine without delay the essential and most efficient means suitable to native economy by which land may be kept in efficient production.

(8) The great importance of establishing a system of mixed farming, involving the proper use of livestock, is discussed and recommendations made for necessary preliminary pasture survey work.

C.

MAINTENANCE OF LAND POLICY.

To be effected by:—

(1) Continued operation of machinery at B.

(2) Increased executive responsibility by Native Administration supported by a more enlightened public opinion resulting from B (4) and (5).

(3) The maintenance by the community of soil conservation works, boundaries, etc., of communal importance (see B (2)).

(4) The provision of adequate maps on which to record for permanent observance such boundaries and demarcations as are required in the execution of conservation plans.

SUMMARY—POST-WAR DEVELOPMENT—AGRICULTURE.

PART II.

The Production of Ample Good Food for All.

Primarily dependent upon the execution of Part I which provides the basis of good husbandry.

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A.	B.
A SUFFICIENT QUANTITY OF FOOD.	IMPROVEMENT IN THE QUALITY OF FOOD.

At present more commonly deficient than Quality. Measures additional to those in Part I by which food supply may be increased.

Closely correlated with soil fertility. Education soil means lack of variety and deficient diet (see Part I).

(1) Early preparation of gardens to ensure timely planting.

(1) Variety of staples necessary, especially in cassava areas. Sweet potatoes recommended. Groundnuts valuable complementary crop both dietetically and culturally, to maize.

(2) The wider use of Reserve Crops, especially sweet potatoes.

(2) Dry season cropping on 'wet' land to increase supply of energy giving and green foods (see Part II A (3)).

(3) Dry season cropping by the use of moist valley bottoms and, eventually, irrigation. Experiment and caution needed, and greater protection from livestock.

(3) Increased cultivation of fruit, bananas of particular value. Other hardy types of dietetic value should be multiplied on Native Authority Seed Farms in vicinity of towns where market provides incentive to development and care.

(4) The stimulus of a ready market for food crops to provide an incentive largely lacking in normal times.

(4) Experimental work. Evolution, selection and multiplication of crop varieties of higher nutritive value (Part II A (7) and Part I B 7).

(5) The more efficient use and seasonal distribution of labour to enable adequate effort to become available for better 'farming' and increased crop production. The use of maize mills and, where suitable, animal-drawn implements would assist.

(5) Animal products. An ample potential supply exists in many districts. Incentives needed to induce greater consumption. Development of ghee and hide industry at attractive prices might prove effective. Scheme has been drawn up for improvement of native cattle by selection on basis of milk yields.

(6) Better storage of food whereby the maximum benefit of increased production may become available to the consumer. A system of N.A. storage at mill sites is recommended.

(7) The introduction, multiplication and distribution of high-yielding crop varieties.

(8) Reduction and elimination of plant pests and diseases, by plant breeding and particularly, field hygiene.

(9) See Part III B (ii).

The Increased and more Economical Production of Cash Crops.

Primarily dependent (as with Part II also) upon the execution of Part I, which provides the basis of good husbandry.

A.

THE CASH INCENTIVE IN NATIVE AGRICULTURE.

Need for an adequate incentive to encourage greater attention and effort in productive agriculture by the more progressive African, who now prefers emigration. It is submitted that guaranteed minimum prices at a reasonable level offer the only attractive incentive. This encouragement should be given primarily to food crops of dietetic value, and their internal consumption fostered by cheap transport and efficient distribution. Financial assistance for competitive export of surpluses may be necessary (see Part II A 4).

B.

OTHER FACTORS INFLUENCING THE EFFICIENCY OF NATIVE PRODUCTION OF CASH CROPS.

See Part I especially B 3

Part II A 1, 3, 5, 6, 7 and 8.

B 5

(i) Development and improvement of domestic water supplies to encourage settlement of new land and to facilitate extended cultivation generally.

(ii) Control of destructive game which constitute a serious hindrance and discouragement in certain areas.

(iii) The scope of native crop production in urban areas adversely affected by the casual cultivation of the land-owning urban employee.

C.

NOTES ON CROPS OF PRESENT OR POTENTIAL ECONOMIC IMPORTANCE (*Incl. Experimental work*).

(1) TOBACCO.

(a) The need for an Experimental Station is emphasised to ensure that the industry is provided with sound and up-to-date advice.

(b) Flue-cured. Experiment in Kasungu district. Importance of quality.

(c) Dark fired and sun cured.

(d) Turkish: Experiments in progress.

(2) TEA. Controlled primarily by the International Tea Committee. Nyasaland may become the Headquarters of East Africa tea research (see also Part III D and E).

(3) TUNG. Need for reinforcing the advantageous position, now held by Nyasaland, by promoting rapid expansion of industry. Separate proposals already submitted to Govt. (see also Part III D and I).

(4) PYRETHRUM. Nyika plateau project now entered upon commercial phase with good prospects of success. Trials in progress elsewhere some of which may offer scope for limited expansion of production.

(5) CINCHONA. Trials in progress, no forecast can yet be made.

(6) DERRIS. Despite the use of selected planting material from Amani, the rotenone content of locally grown derris has invariably been disappointing.

(7) COTTON. Primarily a native crop at present enjoying remunerative prices. Future success depends mainly on the effective control of Red Boll worm on the Lower River, for which recommendations by the E.C.G.C. experts will shortly be completed. Experiment and the evolution of improved varieties continues successfully at the E.C.G.C. station at Chitala.

(8) RICE. A potential alternative staple food and cash crop of growing importance, but requiring the continuation of remunerative prices (see Part II A 4 and 7, and B 1 and 4. See Part III A). Short-term varieties of good quality needed and experimental work in search of them is progressing with good prospects of success. Irrigation on a wide scale will eventually be necessary (Part II A 8 and B 8) See also Part III B (ii).

(9) GROUNDNUTS. Dietetically a most important crop of potential economic importance, enjoying attractive prices at present, the depression of which would adversely affect production (see Part III A and Part II A 4). Improved cultural methods needed, especially the development of interplanting (Part I B 7) see also Part II A and B.

(10) PULSES. The remarks under groundnuts, above, apply although pulses are of rather less importance both dietetically and as a cash crop.

(11) MAIZE. The main staple food of the Protectorate whose cultivation should not be unduly expanded for dietetic, agricultural and economic reasons (see Part I A 7, and Part II B i). Attempts to foster a maize export market would be unwise.

(12) EUROPEAN POTATOES. Production has recently increased and there are hopes of a not inconsiderable trade if connections can be made with ship chandlers in Beira. Competition with S. Rhodesia is unfavourable, but with cheap transport prospects are fair if the keeping quality of the ware can be improved.

(13) VEGETABLES. An export to P.E.A. of minor and local importance.

(14) WHEAT. A cash crop of growing importance in which the Protectorate might attain self-sufficiency if post-war prices remain encouraging and if the results of constant experiment can evolve a better bread wheat (see Part III A, Part II A 3, 4, 7 and 8 and B. 1).

D.

THE MARKETING OF ECONOMIC CROPS.

(1) Must be efficient, expeditious and economical. Improved and more extensive communications are projected but increased transport and loading facilities on Lake Nyasa are urgently needed. Freight rates must be more closely allied to costs (see particularly Part III A and Part II A 4).

(2) The present system of marketing subsidiary native crops and produce is considered adequate.

(3) TEA. The Tea Association might advantageously consider the perpetuation of a system of collective marketing analagous to the successful war-time system at present operative.

(4) TUNG. The present system of collective marketing is considered suitable, meriting extension as the industry expands.

(5) TOBACCO. A complex problem. The handling of Trust Land tobacco by the N.T.B. should continue as at present. There is a body of opinion which considers that all tobacco should be sold through the local auction floor.

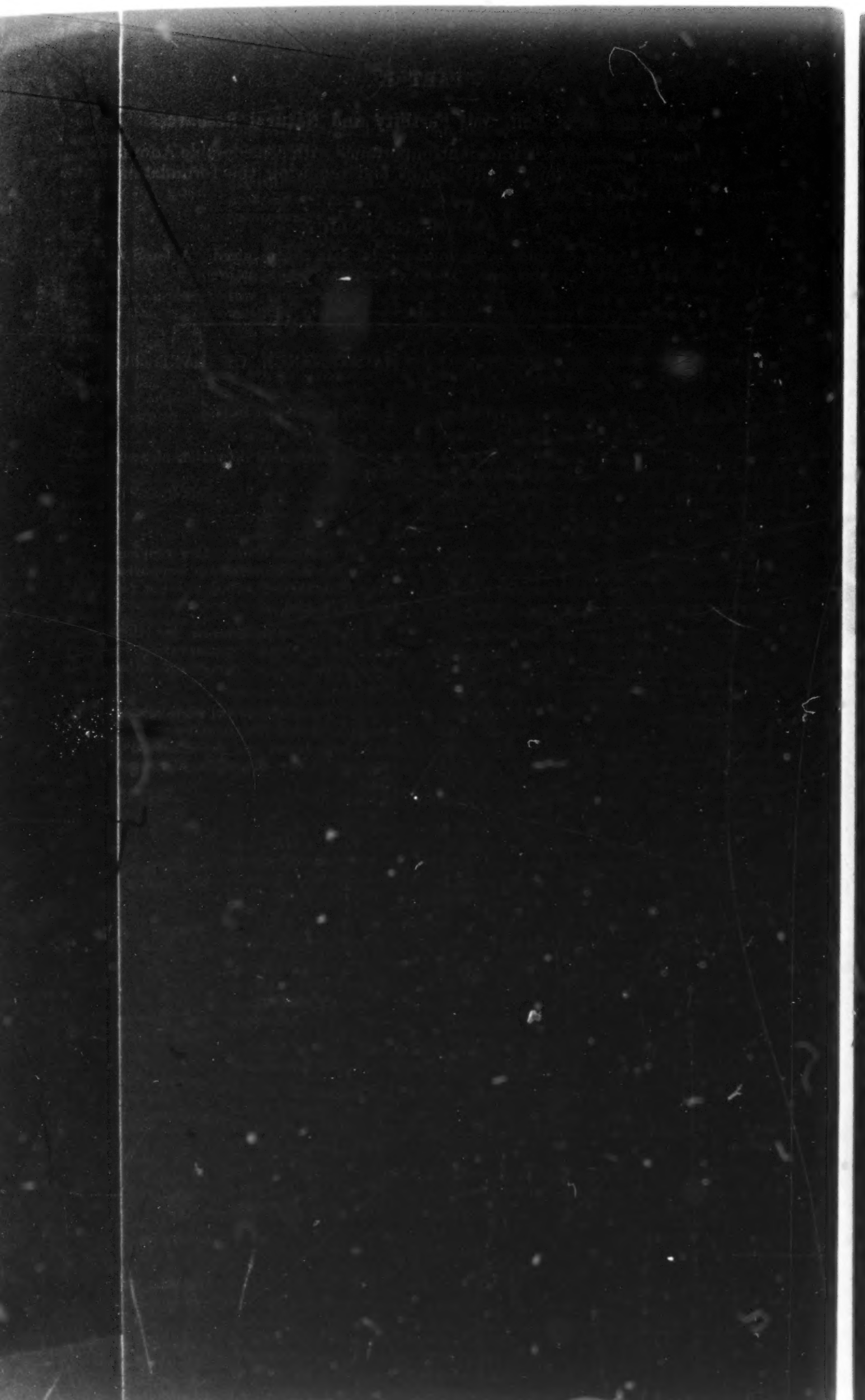
(6) COTTON. Cotton marketing is profoundly affected by external cotton influences and an independent marketing system is impracticable.

E.

LABOUR ON EUROPEAN ESTATES.

The regular supply and efficiency of labour is a prevalent difficulty. A system is discussed wherein this difficulty might gradually be overcome on tea and tung estates by giving selected Africans a large responsibility in estate activities from which they could derive a higher monetary return.

The importance of improved housing, feeding, health and social amenities are considered as factors in inducing better and more regular work.



PROPOSED POST WAR PERMANENT EUROPEAN STAFF OF DEPARTMENT OF AGRICULTURE.

HEAD OFFICE.

AS AT PRESENT.

SOUTHERN PROVINCE.

<i>Station.</i>	<i>Rank of Officer.</i>	<i>Area of work.</i>
BLANTYRE	... Senior Agricultural Officer Agricultural Officer	Southern Province Local area and assis- tant to S.A.O.
CHIRIMBA (Blantyre)	... Agricultural Officer	Blantyre, Central Shire and Chikwawa.
Neno	... Agricultural Assistant	Central Shire.
MLANJE	... Agricultural Officer	Tea Station and Mlanje and Chiradzulu.
Chiradzulu	... Senior Agricultural Assistant	Chiradzulu.
Mlanje	... Probationary Agric. Assistant	On Tea Station and assistant to A.O.
MASAMBANJATI (Cholo)	... Agricultural Officer	Cholo and Lower Shire.
Port Herald	... Agricultural Assistant	Lower Shire.
FORT JOHNSTON	... Agricultural Officer	South Nyasa, Upper Shire and Zomba.
Zomba	... Senior Agricultural Assistant	Zomba Experimental Station and Zomba.
CHOLO	... Agricultural Officer	Tung Station.
Cholo	... Probationary Agric. Assistant	Tung Station.
AGRIC. EDUCATION	... Agricultural Officer	Agricultural Education.

SUMMARY

- 3 Senior Agricultural Officers : 13 Agricultural Officers :
- 4 Senior Agricultural Assistants : 11 Agricultural Assistants :
- 3 Probationary Agricultural Assistants : Total 34.

Of these 34 officers one fifth will be permanently absent on leave. One relief Agricultural Officer and six relief Agricultural Assistants are required if efficiency is to be maintained. Therefore total of proposed establishment is 41.

CENTRAL PROVINCE.

<i>Station.</i>	<i>Rank of Officer.</i>	<i>Area of Work.</i>
LILONGWE	... Senior Agricultural Officer	Central Province.
Lilongwe	... Senior Agric. Assistant	Tobacco and assistant to S.A.O.
LIKUNI	... Agricultural Officer	Likuni Exp. Station, and Kasungu, West Dowa, Lilongwe and Fort Manning.
Likuni	... Probationary Agric. Asst.	Likuni Expl. Station.
Mponela (Dowa)	... Agricultural Assistant	W. Dowa and Kasungu.
Nsaru (Lilongwe)	... Agricultural Assistant	W. Lilongwe and Fort Manning.
Nathenje (Lilongwe)	Agricultural Assistant	E. and N. Lilongwe.
CHITALA (Dowa)	... Agricultural Officer	E. Dowa and Kota Kota.
Mwera Hill	... Agricultural Assistant	Dowa Escarpment and Kota-Kota hill area.
Kota Kota	... Agricultural Assistant	Kota Kota and Dowa Lake Shore area.
NCHEU	... Agricultural Officer	Ncheu and Dedza.
Sharpe Vale	... Agricultural Assistant	Ncheu lowlands and Dedza lake shore.
Tiwi (Dedza)	... Agricultural Assistant	Dedza hills.
TOBACCO RESEARCH	... Agricultural Officer	Tobacco Research.
STATION	... Agricultural Officer	do.
	Agricultural Assistant	do.

NORTHERN PROVINCE.

MZIMBA	... Senior Agricultural Officer	Northern Province.
Karonga	... Agricultural Officer	N. Nyasa.
Mzimba	... Senior Agric. Assistant	Mzimba.
Chinteché	... Agricultural Assistant	Chinteché.

Present authorised establishment of Departmental Field staff is	...	25
(2 Senior Agricultural Officers; 8 Agricultural Officers;		
4 Senior Agricultural Assistants; 8 Agricultural Assistants;		
3 Probationary Agricultural Assistants).		
Required to make proposed establishment	...	16
(1 S.A.O.; 6 A.Os.; 9 Agricultural Assistants).		
Total of proposed establishment	...	41

**ESTIMATED COST OF PROPOSED INCREASED ESTABLISHMENT FOR THE
1ST, 5TH, 10TH AND 15TH YEAR.**

A. EUROPEAN STAFF.

Item.	1st year. £	5th year. £	10th year. £	15th year. £
1. One Senior Agricultural Officer, £880 by £10 to £1,000 ...	880	1,000	1,000	1,000
2. Six Agricultural Officers, £400 for 2 years, £150 by £25 to £600, £660 by £30 to £840 ...	2,400	3,000	3,960	4,860
3. Nine Agricultural Assistants, £300 by £18 to £480 ...	2,700	3,348	4,158	4,820
4. Pension Commitments ...	492	600	744	879
5. Passages ...	3,412	1,742	1,742	1,742
6. Transport and Travelling ...	2,630	2,630	2,630	2,630
TOTALS, EUROPEAN STAFF ...	<u>£12,514</u>	<u>£12,320</u>	<u>£14,234</u>	<u>£15,431</u>

B. AFRICAN STAFF.

7. One Clerk 1st Grade, £50 by £1 to £75 by £5 to £100 by £10 to £150 ...	£50	£66	£85	£120
8. Seven Clerks, 2nd Grade £30 by £3 to £45 ...	210	294	315	315
9. Sixteen Messengers, £7.4s.-0d. rising to £12 ...	115	144	144	192
10. Transport and Travelling ...	48	48	48	48
11. Uniforms ...	40	40	40	40
TOTALS, AFRICAN STAFF ...	<u>£463</u>	<u>£592</u>	<u>£632</u>	<u>£715</u>

C. OTHER EXPENDITURE.

12. Tools and Equipment ...	£100	£100	£100	£100
13. Tents ...	1,600	1,600	1,600	1,600
14. Camp Equipment ...	320	320	320	320
TOTALS, OTHER EXPENDITURE ...	<u>£2,020</u>	<u>£2,020</u>	<u>£2,020</u>	<u>£2,020</u>

TOTALS—RECURRENT EXPENDITURE.

A. European Staff ...	£12,514	£12,320	£14,234	£15,431
B. African Staff ...	463	592	632	715
C. Other Charges ...	2,020	2,020	2,020	2,020
TOTALS ...	<u>£14,997</u>	<u>£14,932</u>	<u>£16,886</u>	<u>£18,166</u>

CAPITAL EXPENDITURE.

1. Seven furnished houses for one Senior Agricultural Officer and Six Agricultural Officers at £1,600 each ...	£11,200
2. Nine furnished houses for Agricultural Assistants at £1,100 each ...	9,900
3. One house for African 1st Grade Clerk ...	100
4. Seven houses for African 2nd Grade Clerks at £80 each ...	560
5. Sixteen houses for Messengers at £50 each ...	800
6. Seven typewriters at £30 each ...	210
TOTAL CAPITAL EXPENDITURE ...	<u>£22,770</u>



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Introduction.

This memorandum contains suggestions and recommendations for a fifteen-year post war soil conservation scheme for the Nyasaland Protectorate but it has been found necessary to embody many other aspects of land usage which are either inseparable from the subject of soil conservation or which appear to have a definite influence in effecting its translation into practice.

PRESENT SITUATION.

1. It must be stated that soil erosion (mainly in sheet form, is still on the increase, particularly in the Northern and Central Provinces) both on Native Trust Land and on alienated states. Remedial measures and land education are not making such rapid strides as erosion, and the situation is steadily aggravated by increases of human and, in some areas, livestock populations. Pressure on the land is therefore gradually increasing and there is no indication that the present slow 'extensive' methods of countering it will bear fruit in time to save a serious state of affairs in the future if indeed such a crisis can be avoided at all. No agricultural system which does not maintain or increase the fertility of its soil can survive, and it is almost inevitable that African agriculture will only undergo such a revolution on any scale in the face of a severe crisis. The common dictum that "things must get worse before they can get better" is true therefore as regards soil fertility; but there are nevertheless many aspects of land usage which can be introduced in a relatively short space of time to reduce the erosion which invariably follows and, at the same time, aggravates the inevitable decline in soil fertility. It is these aspects of land usage for implementation in the near future with which this memorandum deals.

THE CAUSES OF EROSION.

2. Before one can prepare a plan for large scale soil conservation it is essential to review the chief causes of erosion, which are fundamentally the same, though different in extent, on both alienated and Native Trust Land. The seat of most of the trouble is on arable land and the reasons for it are as follows :—

ARABLE LAND.

(a) No practices are employed which improve, or even maintain, the crumb structure and porosity of the soil and some are definitely harmful. Present practices all tend towards soil exhaustion, which is the inevitable precursor of erosion.

(b) The cultivation of land unsuited to the existing standards and methods of agriculture; i.e. on excessive slopes, short term soils and, to a less degree, stream banks.

(c) The predominant Trust Land crop (maize) is one whose habit exposes the soil to the erosive effects of wind and rain to a greater degree than any other crop in a pure stand. Tobacco (and cotton) on alienated land are little better in this connection.

(d) The general use of mound cultivation on Trust Land provides little check to run-off water on sloping gardens.

(e) No dams or storm drains are dug to prevent the erosion of cultivated areas by storm water from uncultivated land above, and few contour bunds are made in the gardens themselves to increase the stability of the soil.

(f) Gully erosion is frequently caused by clean hoeing of drains, paths and boundaries running down slopes.

(g) Land education has so far made inadequate progress and there is very little legal incentive to safeguard the soil.

(h) The excessive density of the population in certain areas. Land unsuited to agricultural purposes is necessarily cultivated in many places for the sole reasons that the natives cannot cultivate elsewhere in the locality.

GRAZING LAND.

3. On grazing land the principal causes of erosion are:—

(a) Excessive concentrations of stock, often for too long consecutive periods and on land incapable of withstanding them, with consequent destruction of vegetative cover both on pasturage and at watering places. No form of herding is practised which has any thought for the soil. Stream banks, gardens, bunds and 'stamping grounds' all suffer in consequence.

(b) Insufficient watering places for stock, causing heavy concentrations round the few places available, particularly in the dry season. Overstocking in districts such as Ncheu. There is no machinery for limiting numbers.

(c) No system of establishing, or management of, pastures has been introduced which will withstand heavy stocking better than do bush pastures.

FOREST LAND.

4. The loss of soil and decrease of water absorption on forest is due to:—

(a) The continuance (despite legislation) of intense late burning of the bush, which reduces the vegetative covering of the soil during the early rains and progressively aggravates the situation by annually retarding the recovery of the trees.

(b) Excessive cutting of natural timber on critical areas such as steep slopes, catchments, gully and stream banks.

The above is a general presentation of the main causes of erosion in the Protectorate, although in certain areas considerable local improvement has been achieved and some of the causes removed.

METHODS OF COUNTERING THE CAUSES OF EROSION.

5. In considering the nature of the causes enumerated above and the possible means of their correction it becomes evident that the remedy lies mainly in the planning, organisation and enforcement of good land usage, and the introduction of better practices by means of determined instruction and propaganda. The organisation, execution and maintenance of land usage plans most definitely requires the backing of comprehensive land usage legislation, and machinery established to enforce it. It is unreasonable to expect Native Authorities to make and enforce rules of which they have not grasped the necessity and have not the inclination to apply. Native Authority legislation is sound because orders are seldom made until all concerned are agreed that they are desirable, but soil erosion will not wait for the slow educational evolution which is a necessary preliminary to this system. Native Authorities and their village headmen would of course be vital instruments in applying such legislation as is made, and the maintenance of land usage work done will ultimately devolve upon the Native Administrations, and will call for the rigid implementation of Secretariat Circular No. NAT. 12/42 of 12th January, 1943, concerning the executive responsibilities of village headmen.

6. Sound land usage is almost as urgently needed on alienated land, and legislation must equally apply and be enforced. The present legislation is largely ignored, and it is thought that what is needed is a local modification of the English Landlord and Tenant legislation, which provides for compensation for improvements and liability for land deterioration. The great majority of Europeans utilising land are not "settlers" in the permanent sense of the word, and must therefore be regarded as temporary tenants on land for which Government is held responsible to the country.

7. Paragraph 2 (c) of the causes of erosion on arable land is the only case in which remedial measures can be undertaken by direct Government assistance on the land, in contra-distinction to organisation in which the executive action is taken by the people themselves under guidance and legislation.

8. The soil conservation methods involved in land usage are none of them new; the problems of applying soil conservation have almost ceased to be technical and are mainly a matter of getting things done. Experience has proved that certain essential practices can be introduced relatively quickly on a wide scale, whereas others, though equally necessary, are opposed by a massive obstinacy, conservatism and indifference which, at the present rate of progress, cannot be overcome in time to save the soil for posterity. Implementing the more unpopular methods of conservation is also complicated in some districts by large scale emigration of the class most likely to adopt innovations.

The Approach to the Problem.

9. There appears to be a five-fold approach to the problem:—

(a) The intensification of propaganda and instruction (backed, where feasible, by legislation), with the object of introducing certain essential fundamental practices, which experience indicates can be achieved by "extensive" methods in a reasonable time. Contour ridges, strip cropping and the institution of resting leys, early cultivation, increase of village forest areas, early grass burning etc., are examples of practices in this category.

(b) The organisation of correct land usage by "intensive" methods involving the concentration of effort to organise all reasonable soil conservation measures which cannot be introduced by "extensive" measures in a reasonable time. The specific aims of such land usage schemes are enumerated in Appx. A, and the work would begin in the most needy areas, from which it would extend. (See para. 11 below).

Note. 9 (a) and (b) should of course be accompanied by comprehensive demonstration particularly in regard to practices designed to raise the fertility of the soil rather than merely to call a halt to present exhaustive methods.

(c) The provision of dams, storm drains and (where necessary) contour bunds, and the reclamation and control of eroded gullies at Government expense with paid labour.

(d) Education of the younger generation to make them land conscious.

(e) The resettlement of excess population from congested areas, wherever possible.

The Practical Introduction of Soil Conservation Measures.

Paragraph 9 (a), (b) and (c) will now be discussed in greater detail in sequence.

10. "EXTENSIVE MEASURES". To put into effect the recommendations of paragraph 9 (a) requires no more than small additions (both European and African) to Departmental Staffs to ensure that the Protectorate is adequately covered and a more rigorous application of 'land usage' legislation.

"Intensive" Methods for the Improvement of Land Usage in Special Areas.

11. This is the main part of the scheme and the one of major importance, since if it can be soundly executed the result should be that a large part of the Protectorate is organised on a sound basis of land usage of some permanence and which will have checked the main causes of erosion. Briefly it is proposed that special areas be selected in consequence of their present need of anti-erosion work. The usage and treatment of each area would then be planned jointly by the administration and the three technical departments concerned, and their decisions would be mapped and recorded. The executive work would then be undertaken by a self-contained unit, headed by an Agricultural Assistant, and with supplementary African staff to provide the necessary concentration. The greatest difficulty is to get done what should be done and it is for this reason that legislative and full administrative backing are necessary to any undertaking of this nature.

12. The following, in order of priority, are recommended as special areas for land usage schemes

NORTHERN AND CENTRAL PROVINCES.

- (a) Central Mzimba.
- (b) Livulezi Valley, Ncheu.
- (c) Dedza hills, Native Authorities Kaphuka and Tambala area.
- (d) Kota-Kota—Doya escarpment area.
- (e) Kasungu district and South Mzimba.

SOUTHERN PROVINCE.

- (a) Chiradzulu District.
- (b) The Cholo-Chikwawa escarpment.
- (c) The Port Herald foothills and Malawe.
- (d) The Makongwa ridge in the Upper Shire District.
- (e) Makanjira's area, along the east shore of Lake Nyasa.
- (f) Mlanje District.

All the above areas are, for reasons of soil, population, livestock concentration, topography and additional strain of economic crops, in definite need of early land reorganisation. In most, if not all of them, initial land usage work has been begun on a modified scale. The work envisaged in the post-war scheme could conveniently be grafted on to, or extended from it.

13. It is proposed that each special area should be divided into blocks—a block being what can be expected as a year's work and would probably include about 1,500—2,000 tax payers; but naturally no hard and fast limits can be set to a task of this nature. It would neither be feasible nor wise to attempt to plan the land usage of all blocks before the scheme began, although it is of course essential in all soil conservation work that the regional picture be kept in view and a too-local outlook avoided. It would be necessary to plan one block only in detail before the scheme began and to plan the following year's work during the execution of the first.

14. It is recommended that fifteen years be the duration of the scheme since in that period it should be possible to extend each special area to cover adequately at least all the more needy portions of the Protectorate. If one special area is completed before the expiration of the time allotted the unit concerned, being a self-contained entity, would be transferred elsewhere to hasten slower work.

15. The juncture at which the special area unit hands over its work to the care and maintenance of normal departmental and Native Authority staffs presents certain difficulties. Clearly the special area staff must hand over a 'going concern' which has not merely been organised but which has settled down. If, however, the special area staff has to tackle a new block annually in addition to maintaining others there will be the danger of weakening the concentration of effort which is essential. It is suggested, therefore, that the special area unit should retain responsibility of each block for three years. In the fourth year when the fourth block is begun the first will revert to permanent staff for maintenance. As the area of responsibility of the special area unit would increase concurrently with its experience, it should not find three blocks an excessive task by the time the third block is undertaken. (The method of maintenance is dealt with in para. 25 below).

16. It is very desirable, if not actually necessary, that a great effort should be made simultaneously to improve economic and social conditions, particularly of the districts in which special areas are undertaken. One must endeavour to establish an economic system under which it is more profitable to increase than to destroy fertility. A certain number of district roads are bound to be required both to facilitate conservation work and maintenance, and also to assist in economic development. In more distant and inaccessible districts transport subsidies will be essential if development is to be possible, and an interest fostered in the products of the soil. Economic improvement will in turn instil confidence into inhabitants in regard to the less understood aspects and unpopular compulsory measures of the land usage schemes. One of the present limiting factors to agricultural progress is the bottle-neck of work at the beginning of the rains. A major aim, therefore, should be to flatten this peak in the labour curve and, apart from the strictly agricultural means of doing so, such as ploughs and early cultivation etc., the provision of power-driven maize mills at centres of population would make much more time available to women for agricultural and other pursuits. This is a matter of considerable importance in a country in which emigration increases the woman's responsibilities so much. Maize mills could be made to pay for themselves by making a small charge in cash or kind for milling. If payment be made in kind in years of plenty the produce could be stored in Native Authority grain tanks against years of shortage.

17. The great importance of women in the social and agricultural organisation, particularly of matrilineal tribes, justifies greater attention to their outlook and influence. It is suggested that quicker advances might be made if a greater desire to make money from the production of economic crops could be inculcated in the women folk. This is partly a matter of education and propaganda, but a more positive approach might be the importation by trading firms of trade goods calculated to appeal particularly to women. No doubt those working with native women, such as Missionaries, could provide a list of articles which might come into this category, and trading concerns could perhaps be encouraged to import them, possibly by a favourable import duty.

18. The necessity for maps has already been mentioned, but some extra emphasis may not be out of place here. Before any special area can be planned for correct land usage maps are essential for at least the first two blocks to be tackled. The remainder can be mapped after the work on the first block has begun. These maps should in the first place show the following data on the scale of 1 mile to 1 inch:—soil and vegetation, population, livestock density, tsetse boundaries, existing forest reserves and village forest areas, and, if possible, some indication of the more steeply sloping sections of the area. All this data is available already or can easily be obtained by existing staff provided that the basic maps are made. It is suggested that if the Lands Office is unable to undertake this work prior to, and during, the scheme, extra survey staff be provided for the purpose. As before the scheme begins, so afterwards, maps would be equally essential to record the permanent land usage plan which had been decided and laid out, in order that later supervisory staffs could see without doubt what had been done and what had to be maintained. It is urged that work in connection with necessary maps be begun without delay, both in preparation for this scheme and for other reasons.

Dams, Storm Drains, Contour Bunds and Gully Reclamation and Control.

19. Although work on the above soil conservation measures would be an integral part of any land usage scheme in a special area yet it differs markedly from the work so far discussed in that it would be done by paid labour at Government expense. It is generally admitted that works of this nature are not a fair charge against the individuals on whose land they happen to be sited, and that the communal system of the inhabitants is so weak and dwindling that no effective effort could be expected of it. The need for any or all of the conservation measures forming the title of this paragraph will vary considerably in each district or special area and even in blocks within it. In Central Mzimba for instance, which is a dry area with a high stock population, small dams to

conserve moisture and disperse watering points would be of high value. The same applies also to a less extent to the Livulezi valley and the Dedza hills. In principle it is recommended that wherever the provision of water is required, and the topography suits it, small dams be built to conserve rain water rather than wells from which it is pumped back out of the ground—this apart from the value of dams in soil conservation, raising the water table and restarting streams. The construction of dams would probably be the responsibility of the water section of the Geological department and provision for such service is being made in the plan for Rural Water Supplies submitted by the Geologist.

20. The labour requirements of all these capital works constitutes a problem in itself since, with emigration, increasing wealth and rival occupations of a more independent character, labour is already and will continue to be a difficult problem in certain districts. The situation may improve slightly after the war when large numbers of askari return, but they will not on the whole be enthusiastic about manual labour at a comparatively low wage.

In other parts of the world soil conservation work is being tackled more and more by heavy mechanical equipment, which is independent of labour difficulties and more efficient and economical in the formation of contour bunds and ditches than similar work done by hand. The patch-work nature, heavy bush and steep slopes in much of this country create problems different to those in the more advanced countries in which mechanical methods are now general; but the capabilities of heavy modern equipment can most probably overcome them, at any rate in such comparatively open, flat country as the Lilongwe and Kasungu plains and parts of Central Mzimba.

It is urged that advantage be taken of experience gained in other countries. The officer in charge of the Soil Conservation Scheme should be allowed to visit America, Basutoland and East Africa to gain first-hand knowledge of their problems and of the methods adopted to solve them.

With particular regard to the construction of dams, which will figure very largely in conservation work in all cattle areas, there can be little, if any, doubt that bulldozers are ideally suited to the work and could construct dams at a far greater rate and probably more economically than manual labour. A supplementary labour force will, of course, be required to work with mechanical equipment, but it should not be large by comparison with the work accomplished by the whole team.

21. Should it be decided that machinery would be an asset in the work, it is suggested that it be operated in independent self-contained units, each under a European foreman and employed in whichever special areas are suitable and have most need for them. The total number of such units required would depend upon expert opinion upon the problems mentioned in paragraph 19. The season during which caterpillar machinery can operate need not necessarily be limited to the dry months if bunds etc., are laid out in that period and planting on the demarcated lines prevented. This is the practice followed in Basutoland.

STAFF REQUIREMENTS.

22. Being primarily a scheme of planning, re-organisation and supervision the question of staff looms larger than that of equipment or any other item of capital expenditure. The special areas, each of which is planned as a separate entity with its own unit, would be supervised by an Agricultural Assistant; but in addition a Headquarters staff would be essential to supervise and co-ordinate the work which would be more than could be undertaken efficiently by the present European strength of the three technical departments concerned. The suggested staff is tabulated in the Estimates attached hereto but needs some elaboration here. The soil conservation scheme for the Protectorate should come under an experienced and qualified Conservation Officer responsible to the Director of Agriculture, in close co-operation with the Heads of the other departments concerned. A competent and reliable Officer should be appointed as assistant to the Conservation Officer and to take over from him during his absence on leave.

An additional Agricultural Officer should be detailed for duties in connection with all aspects of pasture work.

The case for Survey Officers has already been put and it is recommended that they should be appointed in advance of the beginning of the scheme proper, to undertake essential preparatory mapping. Provision for these would be made in the plans for the Protectorate survey. In this connection it is considered that the value of an aerial survey cannot be over-estimated, both for soil conservation purposes and for agricultural planning generally.

23. One Agricultural (Conservation) Officer and six Agricultural Assistants will be required for the Northern and Central Provinces and similar provision for the Southern Province for duties in the special areas. The Assistants should be under 25 years of age, active, keen and decisive in character. Priority would naturally be given to residents of Nyasaland who held the necessary qualifications, but they would almost certainly be insufficient, and outside sources would also have to be tapped.

As far as possible selection should be made from farmers' sons or men with some previous agricultural experience or training and, where this is lacking, opportunity should be given to attend a short course in South Africa. All should then be initiated into local land usage work by an intensive course of one or two months' duration in the most suitable special area already begun. It is also suggested that, as and when vacancies occur in the permanent departmental strength of Agricultural Assistants, they be filled by the best of the special area men and further temporary enlistments made to fill their places.

24. Clearly the success of a scheme depending so largely on organisation and administration and the enforcement of rules makes the fullest Administrative backing absolutely essential and it is urged that an Assistant District Commissioner be stationed permanently in any district in which a special area is in its early stages of development in order that the District Commissioner may be able to devote full interest in the work and add his weight to it. It should be made quite evident from the start that any land usage legislation which has been enacted is to be obeyed.

The Maintenance of Land Usage Work.

25. Needless to say, the maintenance of all this work is as vital as its original organisation, and one must at all costs avoid the risk of later disintegration and reversion to former conditions, which will be a real danger for more than one generation. The system by which the blocks of each special area are handed over to normal departmental staffs has already been briefly described. The special area Agricultural Assistant would, of course, remove his team of supplementary instructors into his new blocks of work, but he would leave behind Rural Assistants whom he had specially selected (probably from ex-askari) and trained in their duties during his period of responsibility for each block. Their duties would be non-technical and would simply be to see that what had been ordered and organised was also maintained. It is suggested that a Native Authority's section of average size would require 6 - 8 Rural Assistants each trained in Agricultural Forestry and Veterinary maintenance work. These Rural Assistants would be well paid and under the joint guidance of the departments in whose work they were engaged. They would be taught to read the land usage maps which had been prepared to show the closed areas, rotational grazing sites, village forests, etc. The fundamental importance of these permanent record maps cannot be over-stressed if provision is to be made for real continuity in maintenance, despite the frequent changes of officers, which has formerly allowed many soundly conceived schemes to fall into oblivion.

26. It is assumed that the legislation urged as essential in paragraph 5 would be drawn up to cover maintenance, and that in it would be included clauses for preventing the uncontrolled movement of villages and bodies of individuals on to new land. Such movement should be prohibited without permission and should not be allowed if it is the result of mis-use of land perpetrated after full opportunity has been provided and adequate instruction given for good land usage methods.

27. The maintenance of better farming methods on private estates would hinge largely on the enforcement of the land usage legislation drawn up, and it would become the function of a trained agriculturist of the Lands Department to undertake periodic inspection to assess the value of improvements and depreciation.

LEGISLATION.

28. The question of legislation for land usage on Native Trust Land is not simple. The administrative policy is clearly that certain fundamental matters should be provided for in Ordinances, but that the majority of land improvement aspects should be urged by Native Authority Orders in conformity with the progress of the people's enlightenment. This is obviously sound, but slow, and any decision to alter it must depend on a true assessment of the importance of time in soil erosion. If certain measures are deemed essential, but in native eyes are unimportant, then the legislation should be enacted and enforced by Government with every effort possible made to explain the reasons for it to the Native Authorities and people. The land usage legislation adopted in Sukuma, Tanganyika Territory, would appear to be an example of what is needed in this country. In the province concerned the orders were made by the Native Authorities, but one understands that they are far more enlightened and forceful, and their people more amenable to discipline and communal effort than is the case in Nyasaland. Furthermore their land needs are more obviously pressing at the present time.

29. There exists already in Nyasaland a certain amount of land usage legislation to be found, partly in the Forest Ordinance and partly in Native Authority Orders. Other Orders made by Native Authorities are not being seriously observed. Examples of this are to be found in compulsory herding of cattle orders in Ncheu and ridge cultivation orders in various other sections. Admittedly it is difficult at present with attenuated European staffs of all departments to enforce legislation, but if the increases recommended for this post-war work materialise there will be sufficient to implement orders, which again will be essential if the staff are to be enabled to accomplish sound permanent work in the relatively short time available. It is suggested that one comprehensive and homogeneous Ordinance be made to cover all aspects of the problem and that the applicable sections in the Forest Ordinance be transposed. The justification for stronger action depends entirely upon whether time is accepted as the vital consideration.

PROPAGANDA.

30. Both for the results which it should itself attain and in explanation and amelioration of more vigorous measures, propaganda is essential. If a real whole-hearted attempt is to be made in the fifteen years set aside for this work all methods of approach should be co-ordinated and concentrated. It is considered that one or more ex-army mobile cinemas should be the nucleus of propaganda units which should be constantly on tour. The value of propaganda and instructional films has been amply demonstrated during the war, and the African is particularly interested in them. Striking, coloured posters to illustrate various points would also be a help, and an illustrated propaganda pamphlet designed to appeal particularly to the more educated and influential would be most helpful. Propaganda should be directed very largely to appeal to women folk (see para. 17 above).

31. The dangers of a spate of unco-ordinated propaganda are fully realised and it is suggested that there should be a Protectorate propaganda organisation which would collate, co-ordinate and organise propaganda on behalf of all Government departments. In particular the mobile propaganda unit referred to in the preceding paragraph should be responsible for disseminating propaganda dealing with all aspects of rural life.

Summary.

- (1) Soil erosion, particularly in its sheet form, is becoming increasingly serious in the Protectorate.
- (2) The causes of erosion are reviewed and lead to the conclusion that the remedial measures should be primarily a matter of organisation of land usage and increase of fertility but that in certain areas dams, storm drains and contour bunds may be an essential adjunct.
- (3) Comprehensive legislation to achieve and maintain good land usage is essential both on alienated and Native Trust Land.
- (4) There is a five-fold approach to the problem of soil conservation.
 - (a) 'Extensive' methods over the whole of the Protectorate to achieve the primary measures of soil protection.
 - (b) 'Intensive' effort to organise more advanced land usage and conservation in eleven selected special areas which would expand annually in blocks containing 1,500-2,000 tax-payers.
 - (c) The provision of dams, storm drains, contour bunds and the reclamation and control of gullies by Government funds as necessary in each special area.
 - (d) The 'land education' of younger generation.
 - (e) The resettlement of excess population from congested areas.
- (5) The whole scheme is recommended for 15 years duration which should suffice to cover all the more needy areas of the Protectorate.
- (6) The main requirement is staff. The qualifications of the European staff are given and short courses of training recommended, if necessary, in the case of new Agricultural Assistants for special areas.
- (7) The great importance of preliminary mapping and recording of useful data for each special area is stressed and the necessity for maps to assist in maintenance of land usage work afterwards is also discussed.
- (8) Organisation and legislation for efficient maintenance are vital, and recommendations are put forward for the gradual handing over of special areas, block by block, to normal departmental staffs, and for the provision of Rural Assistants and legislation to see that what was laid down and organised is continued.
- (9) The fullest administrative backing would be essential throughout the scheme, which might involve temporary increase in the administration staff of certain districts.
- (10) The type of legislation required for land usage on Trust Land is briefly discussed.
- (11) The importance of whole-hearted, modernised propaganda is considered an essential part of the scheme.

APPENDIX

ESSENTIAL SOIL CONSERVING MEASURES TO BE INTRODUCED ON A REGIONAL PLAN IN ALL SPECIAL AREAS.

1. GENERAL. Allocation of land to its most suitable purpose for the improvement and maintenance of native economy and soil fertility.
2. AGRICULTURAL MEASURES.
 - (a) Prohibition of cultivation on critical areas, such as excessive slopes, potential gullies, stream banks, road sides, etc.
 - (b) Contour ridge cultivation, strip cropping and resting leys.
 - (c) Early preparation of gardens, burying of trash and timely bush fallow (or rest under fallow crop) to be achieved by intensified propaganda.
 - (d) Contour bunds
 - (e) Storm drains
 - (f) Dams
 - (g) Gully reclamation and control
 - (h) Extensive demonstration of compost and manuring.
3. FORESTRY.
 - (a) Enforced early burning.
 - (b) Encouragement of enforcement of village forest areas up to 100% of village requirements.
 - (c) Stream bank control and planting of trees and bamboos.
4. LIVESTOCK.
 - (a) Controlled rotational grazing.
 - (b) Management, improvement and fencing of pastures.
 - (c) Provision of dams, where necessary, and control of watering places.

DIRECTOR OF AGRICULTURE.

(Chief Veterinary Officer).

(Conservator of Forests).

Soil Conservation Officer.

Assistant Soil Conservation Officer.

Head Mechanic

Propaganda Officer.

Agricultural Officer (Pasture)

Surveyor. Central and Northern Provinces.

Southern Province.

Agricultural Officer Central and Northern Provinces.

Agricultural Officer

Junior Mechanic

European Clerk.

6 Agricultural Assistants.

6 Agricultural Assistants.

EUROPEAN STAFF.

1. **SOIL CONSERVATION OFFICER.** The person appointed to this post should be selected with great care. He should be fully qualified in the theory of soil conservation and have had practical experience of organised soil erosion measures. Unless he happens also to have had experience in mechanical methods of soil conservation it is suggested that before taking up his post, he should visit either the United States or Soviet Russia for the purpose of gaining this experience. It is most desirable also that he should be a young man so that, if possible, the scheme would be controlled and planned by him throughout its duration. If the Officer selected is recruited within the Colonial Service it is suggested that his salary should be £920 per annum, £1,100 if serving under the New Pension Conditions. If recruited outside, the suggested salary is £1,200 per annum. In this latter event the post would be non-pensionable and the person appointed should contribute from his salary to a Provident Fund. Housing should be provided and office accommodation in recruitment that from outside the Colonial Service is to be preferred in order to ensure continuity of direction throughout the scheme. An Officer already serving in the Colonial Service would almost certainly qualify for promotion to a new appointment at some stage during the course of the scheme.

2. **ASSISTANT SOIL CONSERVATION OFFICER.** The remarks in the preceding paragraph apply equally to this appointment. If recruited within the Colonial Service salary at the rate of £840 is suggested (£920 if under New Pension Conditions). If recruited outside £1,000 per annum is suggested. A house in Zomba would also be necessary.

3. **THREE AGRICULTURAL OFFICERS.** Of these appointments one Officer is required for pasture work throughout the Protectorate whilst the others will be the Executive Officers of the Scheme. It is suggested that they should be selected from within the Colonial Service and seconded to the scheme. Continuity, though desirable, is not essential in these posts and it is considered probable that the officers concerned would qualify for promotion elsewhere after a period of secondment to the scheme. The salaries of these appointments are already fixed viz. £480—£720, or £400—£840 under the New Pension Conditions. Three houses would be required.

4. **TWO SURVEYORS.** Paragraph 18 of the Memorandum refers. It is not considered possible that the intensive and detailed survey work required could be undertaken as a departmental measure by the Lands Office and provision is therefore needed for Surveyors to be attached to the scheme. Their work, though designed primarily in furtherance of the scheme, will be of permanent value to the Protectorate. Salaries as in the case of the Agricultural Officers in the preceding paragraph. Two houses.

5. **TWELVE AGRICULTURAL ASSISTANTS.** Paragraph 11 of the Memorandum refers. These would all be local (including South Africa) appointments. They should be young men of a vigorous type, accustomed to handling native labour and, as far as possible, acquainted with local languages and native usage. It will be these men who will carry out the actual work in the special areas and its maintenance thereafter. The salary scale should be that as applied to the corresponding posts in the Department of Agriculture, viz. £300 x 18—£480. Semi-permanent pise-de-terre houses would be needed, these being erected as required and as new areas come within the orbit of the scheme.

6. **PROPAGANDA OFFICER.** Paragraph 3 of the memorandum refers. These duties could best be undertaken by an Administrative Officer seconded for the purpose. If, however, it is necessary to resort to recruitment outside the Colonial Service a fixed salary of £900 per annum is suggested. In this case the post would be non-pensionable. One house is required.

7. **HEAD MECHANIC.** This officer will be in charge of the mechanical units. The post should be non-pensionable and the salary suggested is £480 x £20—£600. The base of operations will be constantly changing so that semi-permanent pise-de-terre accommodation will be required.

8. **JUNIOR MECHANIC.** The salary suggested is the same as that proposed for the Agricultural Assistant, viz. £300 x £18—£480. Housing as provided for in paragraph 7 above.

9. **EUROPEAN CLERK.** This appointment will be required at the headquarters of the Soil Conservation Officer. In addition to correspondence there will be much accounting work to be undertaken which, it is considered, will require the attention of a European Clerk. The suggested salary scale is £300 x £18—£480. One house required.

AFRICAN STAFF.

1. **FIVE CLERKS.** These will be required as follows:—

3 Clerks for the Headquarters Staff (comprising 6 European Officers).
(2 at £50 x £4—£75. One at £30 x £3 to £45).

2 Clerks, one for each of the Provincial Agricultural Officers.
(2 at £50 x £4—£75).

AFRICAN STAFF (Contd.)

2. **FIVE MESSENGERS.** As above. (£8 x £1—£15).
3. **THREE MECHANICS.** For duty with the mechanical units. (£50 x £4—£75).
4. **FOUR DRIVERS.** Numbers dependent upon the number of units employed. (Two at £50 x £4—£75. Two at £30 x £3—£45).
5. **FOUR DRIVERS MATES.** As above. (£8 x £1—£15).
6. **TWO DRAUGHTSMEN.** For duty with the European Surveyors. (£50 x £4—£75).
7. **120 AGRICULTURAL, VETERINARY AND FORESTRY INSTRUCTORS.** Paragraph 11 of the Memorandum refers. The numbers will vary according to the work in hand but it is considered that when the scheme is in full operation each Agricultural Assistant will require approximately ten Instructors in his unit.
8. **LABOUR.** This item is necessarily elastic. There will be many projects which will entail the employment of paid labourers, particularly so in areas where mechanical units cannot be employed.

Estimate.

(It will have been noted that alternative salary scales have been mentioned for various officers. For the purpose of these Estimates the highest figure has been taken in each case).

(a) PERSONAL EMOLUMENTS.

Serial No.	Number.	Appointment.	Cost for one year.	Cost for 15 years.	Remarks.
			£	£	
1.	1	Soil Conservation Officer ...	1,200	18,000	
2.	1	Assistant Soil Conservation Officer ...	1,000	15,000	
3.	3	Agricultural Officers ...	2,520	37,800	
4.	2	Surveyors ...	1,680	25,200	
5.	1	Propaganda Officer ...	900	13,500	
6.	12	Agricultural Assistants ...	—	74,520	(a)
7.	1	Head Mechanic ...	—	8,580	(a)
8.	1	Junior Mechanic ...	—	6,220	(a)
9.	1	European Clerk ...	—	6,220	(a)
AFRICAN STAFF.					
10.	5	Clerks ...	—	4,766	(a) (b)
11.	2	Messengers ...	—	985	(a) (b)
12.	3	Mechanics ...	—	3,102	(a) (b)
13.	4	Drivers ...	—	3,328	(a) (b)
14.	4	Drivers Mates ...	—	788	
15.	2	Draughtsmen ...	—	2,068	(a) (b)
16.	120	Instructors ...	—	52,980	(a) (b) (c)
17.	—	Labour ...	—	30,000	

£303,057

(b) OTHER CHARGES.

		£	£	
18.	Transport and Travelling	2,470	37,050	(a)
19.	Tools and Equipment	300	7,500	
20.	Passages	—	21,422	(a)
21.	Pension Commitments	—	10,718	(a)
22.	Books and Periodicals	30	150	
23.	Uniforms	—	—	
24.	Propaganda and Publications	100	1,500	
25.	Upkeep of houses and offices	—	—	
26.	Upkeep of Camp Equipment	50	750	
27.	Transport of Goods	100	1,500	
28.	Upkeep and running of Mechanical Equipment	1,000	15,000	
29.	Contingencies	100	1,500	
30.	Films and upkeep and running of Propaganda film unit	200	3,000	
31.	Stationery	150	2,250	

TOTAL £132,610

(c) SPECIAL EXPENDITURE.

Serial No.		Cost for one year.	Cost for 15 years.
32.	Permanent houses (with furniture)	...	13,500
33.	Permanent Offices (with furniture)	...	2,000
34.	Pise-de terre houses	...	10,000
35.	Furniture for pise-de terre houses	...	720
36.	Mechanical equipment	...	20,000
37.	Camp equipment	...	805
38.	Office equipment (including 4 typewriters)	...	200
39.	Mobile Workshop	...	2,000
40.	Propaganda film unit	...	1,200
41.	Survey equipment	...	300
	TOTAL	...	£50,725
TOTALS:			
(a)	Personal Emoluments	...	3
(b)	Other Charges - Recurrent	...	1
(c)	Other Charges - Special Expenditure	...	
	GRAND TOTAL	...	£4

Notes on Estimates.

(a) Estimate based on the assumption that each person appointed starts salary of the scale.

(b) Salary scales as for comparable appointments in the Native Civil Service

(c) Estimate based on the assumption that half the Instructors will be trained the other half untrained.

i.e. 60 at £19 by £2 to £27 by £3 to £45.

60 at £15 by £2 to £27.

(d) Estimated expenditure per annum:

Soil Conservation Officer	...	...
Assistant Soil Conservation Officer	...	...
3 Agricultural Officers at £150	...	...
12 Agricultural Assistants at £75	...	...
2 Surveyors at £75	...	...
Propaganda Officer	...	...
Head Mechanic and Junior Mechanic	...	...
Bicycle allowance to 60 Instructors	...	...
Subsistence allowance—all Officers	...	...
TOTAL	...	£2

(e) Nine at £1,500 each.

(f) Twenty-three sets at £35 each.

(g) See Schedule attached.

EUROPEAN STAFF.

Estimated Cost of Passages

Estimated Pension

		£	£	s.
1	Soil Conservation Officer	(a) 1,834	2,700	0
1	Assistant Soil Conservation Officer	(a) 1,834	2,250	0
3	Agricultural Officers	(b) 5,502	5,670	0
2	Surveyors	(b) 3,668	3,780	0
1	Propaganda Officer	(a) 1,834	2,025	0
12	Agricultural Assistants	(c) 5,400	11,178	0
1	Head Mechanic	(d) 450	1,197	0
1	Junior Mechanic	(d) 450	931	10
1	European Clerk	(d) 450	931	10
AFRICAN STAFF.				
5	Clerks	...	714	18
3	Mechanics	...	465	6
4	Drivers	...	499	4
1	Drivers Mates	...	118	4
5	Draughtsmen	...	810	4
120	Instructors	...	7,947	0
		£21,422	£40,717	16

Say ... **£40,718**

(a) £360 ÷ 4 = £197 £197 Passages to U. K. based on pre-war rates.

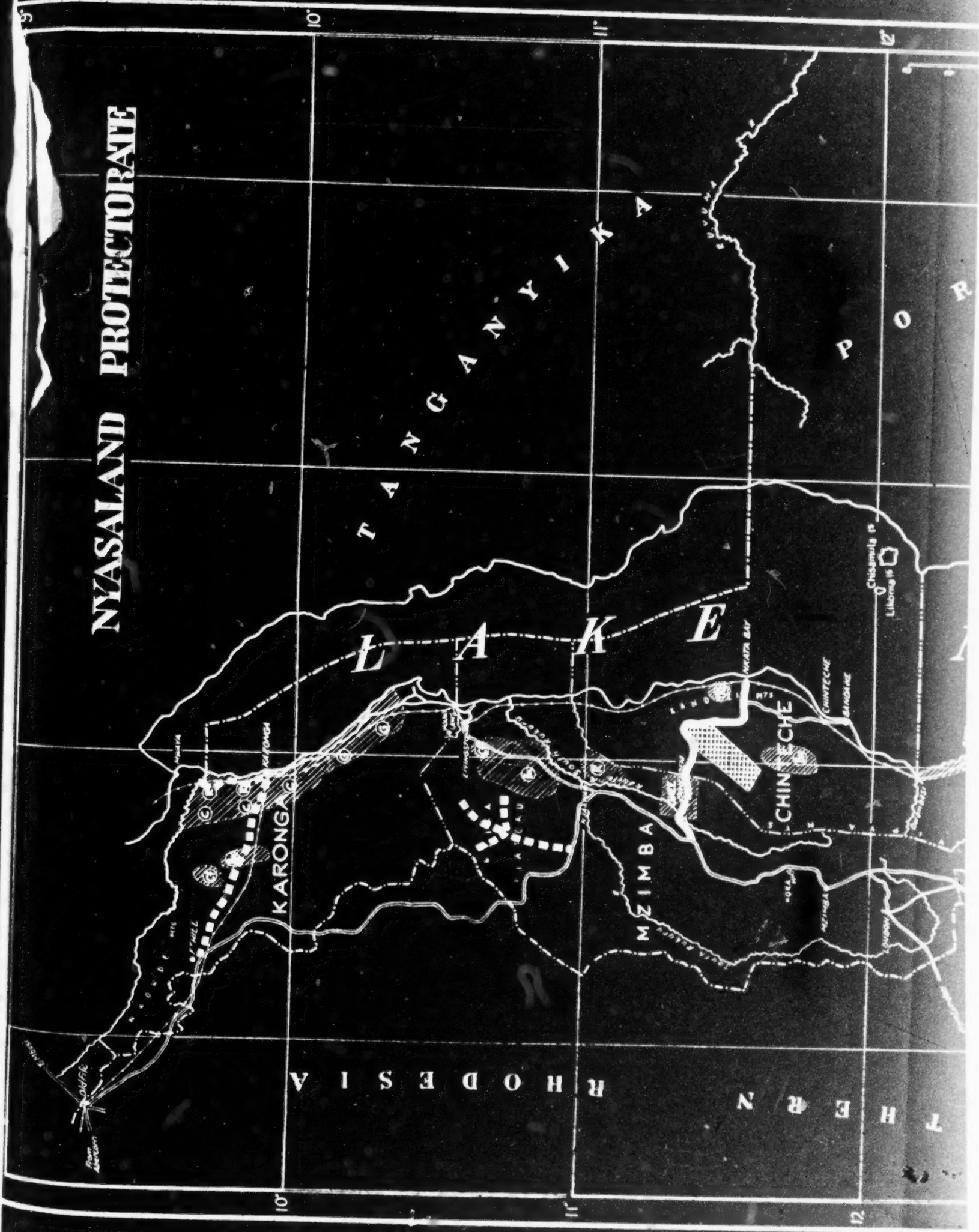
(b) £360 ÷ 4 = £197 £197 × 2 Mail passages; 2 single at £197 each and 4 £360 each.

(c) £90 ÷ 5 × 12

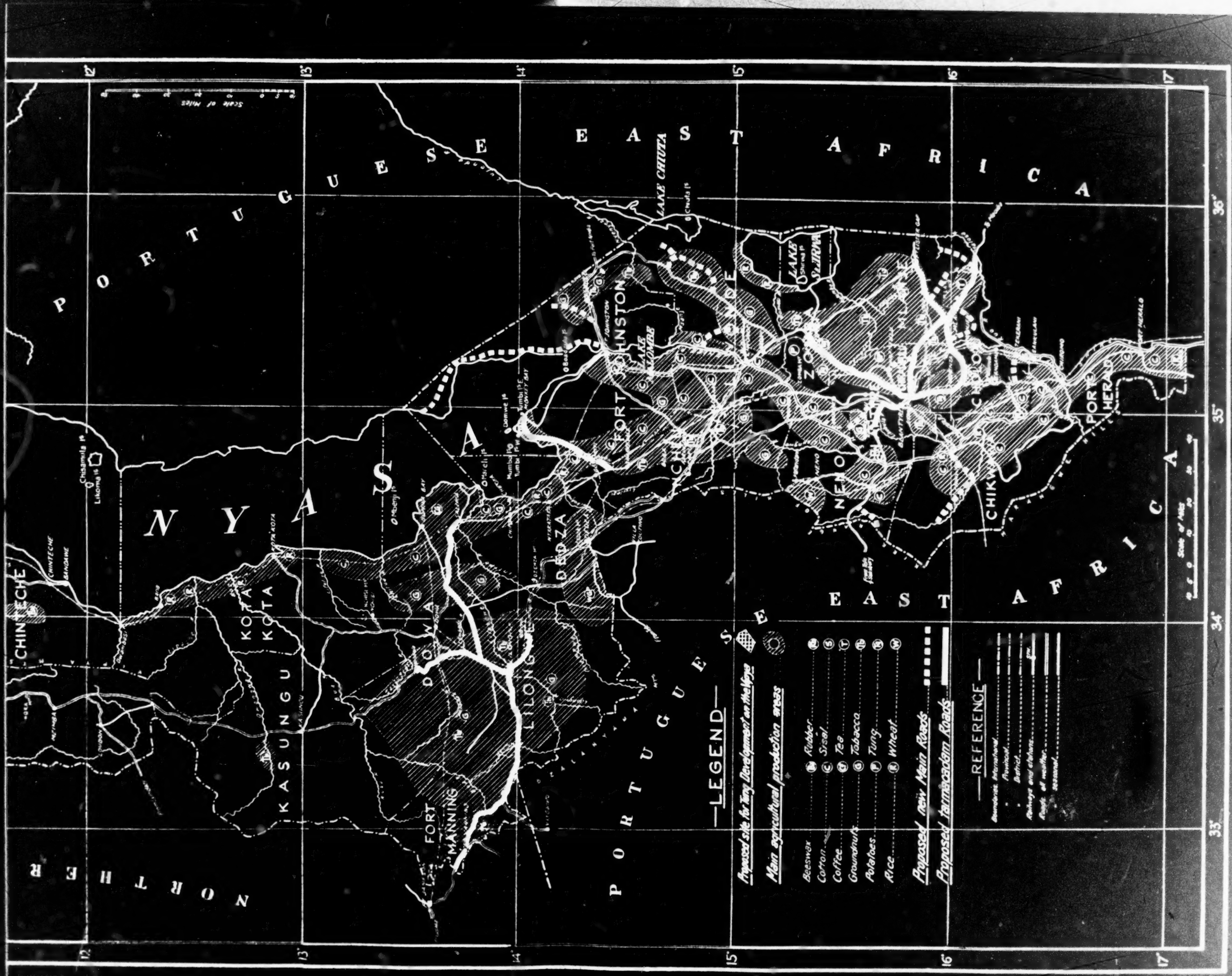
(d) £90 ÷ 5 Passages to S.A. at £45 each way.

All passages based on married rates, but no provision made for children.
Cost of pensions based on 15 per cent. of total salaries for the 15 years.

NYASALAND PROTECTORATE







—LEGEND—

Proposed site for Tung Development on the Shire

Main agricultural production areas

- Beeswax.....(B) Rubber.....(R)
- Cotton.....(C) Sisal.....(S)
- Coffee.....(T) Tea.....(T)
- Groundnuts.....(G) Tobacco.....(T)
- Potatoes.....(P) Tung.....(T)
- Rice.....(R) Wheat.....(W)

Proposed new Main Roads

Proposed tarmacadam Roads

—REFERENCE—

- International
- Provincial
- District
- Railways and stations
- Height of weather station